Quest® InTrust 11.3

User Guide

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Legend

■ **WARNING: A WARNING icon indicates a potential for property damage, personal injury, or death.**

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

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

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First Steps

InTrust is an event-log management solution that provides for collection, correlation, archival, and reporting on the heterogeneous audit data from your enterprise-wide network. InTrust real-time alerting and notification capabilities allow you to stay aware of what is going on in your network and how your business-critical resources are functioning.

Although InTrust is a powerful and comprehensive framework for audit data, deployments can range widely in complexity. The following types of coverage are all possible:

- Basic everyday security auditing with a minimal set of components
- Archival of audit data in compressed repositories for regulations compliance
- Fast search and reporting tools that work with repository data
- Real-time monitoring for critical security events, with alert tracking and automated response actions
- Auditing of multiple platforms and custom logs with advanced reporting based on SQL Server Reporting Services
- Combinations of the above

This guide explains only the use of the basic InTrust deployment. More sophisticated features and workflows are described elsewhere in the InTrust documentation set—for example, in the Deployment Guide.

Installing InTrust

Before you begin installation, confirm that the system requirements are met (see System Requirements). Also note that the InTrust installer verifies this automatically.

To begin installation, use the Autorun application that comes with your InTrust distribution; click **InTrust Default Suite** on the **Install** tab to begin setup.

> **NOTE:** If you need custom InTrust capabilities, consider the **InTrust Extended Suite** option, which is not covered in this set of topics. For details, see the Deployment Guide.

Next, complete the remaining steps.

> **CAUTION: The default InTrust components require that ports 900, 8340 and 8341 be open for inbound traffic. The InTrust installer knows how to configure these ports automatically in Windows Firewall. However, if you use a hardware or third-party software firewall, make sure these ports are open.**

Participation in the Quest Software Improvement Program

One of the setup steps prompts you to select the country where you are performing InTrust installation. This choice affects whether your participation in the Quest Software Improvement Program is enabled automatically.

The Software Improvement Program involves Quest receiving anonymous usage statistics from the Quest software you install. No personal identifying data (such as account names) is included in this feedback. The purpose is to determine which features are most popular and find out how their use can be streamlined.

The following information is transmitted:

- Hardware configuration
- Which product features are used
- External IP addresses

Participation is voluntary. Although it is enabled automatically for some countries, you can change your choice at any time after InTrust setup is complete; for details, see the Installing the First Server in InTrust Organization topic in the InTrust Deployment Guide.

Collecting Events in Real Time

After you have installed the default components, run the InTrust Deployment Manager console by clicking its entry in the Start menu. This console manages gathering of audit data to InTrust repositories.

In the console, you need to specify the computers you want to audit and specify what kinds of events you need. This is done by setting up collections. Collection settings include the computers to collect from, data sources (definitions of the types of events) and the repository to collect to. Simply put, the point of a collection is to “get this kind of data from these computers to this repository”.

For gathering to work, computers in collections need to have InTrust agents installed. You can install agents on specific computers by selecting them in the right pane while a collection is highlighted and clicking **Install Agents**. Alternatively, enable the **Install agents automatically** option while you are creating or editing a collection to automatically install them on all computers in the collection. If this option is off in a newly-created collection, no gathering occurs. Once you enable it, agents are installed and gathering begins.

> ! CAUTION: **If the Install agents automatically option is enabled for a collection, InTrust will try to keep the agents on all computers in the collection. If you uninstall an agent from a computer in such a collection, it will be reinstalled automatically.**
>
> **In this situation, to stop gathering from a computer, you need to remove it from the collection.**
>
> **If the Install agents automatically option is disabled, you need to install and uninstall agents manually using toolbar commands.**

When you run InTrust Deployment Manager, you are directed to the home view, where you are briefly introduced to the basics of real-time event collection workflow. This view explains collections (how InTrust organizes computers to collect from) and repositories (stores to collect data to), and it provides quick action links to help you get work done.

If you are starting InTrust Deployment Manager for the first time, take the opportunity to create a collection in the home view: either a Windows collection for gathering from Windows computers or a Syslog collection for capturing Syslog messages from devices and hosts.

Introduction to Repositories

An InTrust repository is a store for audit data collected by InTrust. Its architecture is such that massive amounts of data can be stored efficiently in a compact way and indexed for fast browsing in InTrust Repository Viewer and streamlined access by IT Security Search.

This helps achieve security regulations compliance and provides a ready-made toolset for event analysis. For an in-depth description of InTrust repositories, see the Understanding InTrust Repositories topic.

For the purposes of this guide, however, it is sufficient to know the following about repositories:

- When you set up InTrust, a default repository is automatically created for you in the InTrust installation folder (by default, installation to Program Files is suggested). Note that the default repository is not recommended for real production use, but only for evaluation and training. When you are confident with the InTrust workflow, create your own repository on a server that has ample disk space and is ready for intensive disk writes.
- You can use the default repository for all your logon and user session auditing needs (unless further scaling is required).
- The folder where you create a repository should be available over the network.
- If necessary, you can have multiple repositories, specialized by the type of data they are supposed to contain, by their location, or by some other characteristic. However, try to keep a manageable number of repositories.
- The toolset described in this document works only with indexed repositories and provides no way to disable repository indexing. Although disabling it is possible in the InTrust Manager component, you should not do it for repositories where indexing is ever going to be enabled again, because indexing will not be able to catch up unless this is a very recently created repository.

To manage repositories, use the **Storage** view in InTrust Deployment Manager.

Common Tasks

The following topics describe how you can manage and adapt InTrust using the InTrust Deployment Manager console.

- Managing Collections
- Analyzing Collections
- Managing Repositories
- Gathering Windows Logs Other than Security, Application and System
- Load Balancing

Managing Collections

You can add, delete and edit collections at any time. To work with collections, go to the **Collections** view of InTrust Deployment Manager.

To create a collection, right-click the **Collections** node and select **New Windows Collection** or **New Syslog Collection**. To edit or delete a collection, right-click it and use the corresponding command.

To add computers to a collection

Use any of the following methods:

- In the wizard that opens when you edit a collection, change the computer list on the Specify Computers step.
- Select the computers you need in the **Computers not in a collection** search folder in the navigation pane and click **Add to Collection** (in the toolbar or in the shortcut menu), and then select the collection you need.
- Supply a computer list in a plain-text file. For that, in the wizard that opens when you edit a collection, click **Add Computer** and type the local path to the file containing computer names or IP addresses of computers you want to collect from. Note that this is only a one-off import action. InTrust does not track changes to the file or remember its location.

To delete computers from a collection

1. Right-click the collection and select **Edit Collection**.
2. In the wizard that opens, go to the Specify Computers step.
3. In the list of computers, select the computers you do not need, and click **Remove** (in the toolbar or in the shortcut menu).

To stop gathering from a computer without removing it from a collection

This works only in collections where the **Install agents automatically** option is disabled. In such collections, use the **Install agent** and **Uninstall agent** commands (in the toolbar or in the shortcut menu) to manage gathering without affecting collection membership.

In addition, the following management actions can be done in the wizard:

- Change the account used for connecting to the computers in the collection
  Set the credentials on the Specify Computers step.
- Change the list of logs that are gathered
  Select the data sources you need on the Data Sources and Repository step.

> **NOTE:** Some of the computers in the collection may not have the logs that the data sources expect. If you do not want InTrust to treat such situations as errors, select the **Suppress errors from non-existent data sources** option on the Data Sources and Repository step. This will make sure that the auditing status of an agent will not be affected if a specified log is not found.

- Change the repository that events are gathered to
  Select the repository on the Data Sources and Repository step.

Analyzing Collections

When a collection is selected, the right pane shows a table with information about the collection members. The table supports multi-level grouping of collection computers, so that you can organize the computers in tree-like views using any criteria. For example, you can group computers by status, then by domain, then by type.

To use multi-level grouping, drag table column names from the computer list to the area above the list. The computer list changes accordingly.

ℹ **NOTE:** The difference between the “Not Installed” and “Failed” computer statuses is as follows:

- “Not Installed” means agent installation has never been tried for this computer.
- “Failed” means agent installation has been tried but failed

To hide the computers you are not interested in, you can use view filtering. To configure a view filter, use the controls underneath the table column names: click the operator icon to select the operator, and specify the value to filter by.

The same grouping and view filtering techniques are available in the views with search folder results.

Managing Repositories

You can add, delete and edit repositories at any time. To work with repositories, go to the **Storage** view of InTrust Deployment Manager.

In this view, the left-hand pane lists the available repositories, and the right-hand pane shows the properties of the selected repository.

To create and delete repositories, use the **New** and **Delete** buttons. To edit the properties of a repository, select it and click the **Edit** link for the group of settings you want.

ℹ **IMPORTANT:** The defining property of a repository is the path to the network share that contains the collected data. When you specify the path, use a UNC name. This makes the repository available to client applications in the network, such as Repository Viewer and IT Security Search. It will also make it easier to integrate the repository into an extended InTrust deployment if you decide to perform it.

You can also create a repository when you create a new collection or edit an existing collection (see Managing Collections), on the Data Sources and Repository step of the wizard.

Setting Up Daily Cleanup

You can configure a repository to keep only recent data and automatically discard data that is too old. For that, edit the **Daily Cleanup** settings in the repository properties in the **Storage** view. Specify how old data can get before it is considered too old and at what time daily cleanup should start.

Gathering Windows Logs Other than Security, Application and System

Applications and Services Logs

To gather a third-party Windows event log that is available in the Applications and Services Logs subtree in Windows Event Viewer, you need to create a data source for it. This is done in the wizard used for creating and editing collections, on the Data Sources and Repository step.

Proceed to that step, and then do the following:

1. Click **Add**. The New Data Source dialog box opens.
2. Specify a meaningful name for the new data source. Optionally, provide a description.
3. In the text box below, specify the exact log name.

ℹ **NOTE:** If you don't know the name, look it up in Event Viewer, as follows:

1. Run Event Viewer on a computer where the log is available, and locate the log you need.
2. Open the properties of the log. The name is in the **Full Name** text box.

4. Click **OK** to save the new data source, and select the check box next to it in the data source list.
5. Complete the wizard.

Forwarded Events

One of the available Windows log types is Forwarded Events. If subscription-based logging of these events is enabled, InTrust can collect them just like other events. It is possible to configure the gathering using the procedure above; the exact log name in step 3 is **ForwardedEvents** in this case.

However, due to the limitations of this forwarding technology, data in the forwarded events is mostly meaningless. You can gather it to a repository, but you cannot search in it or build reports on it. Therefore, collecting this data is not recommended. Instead, use InTrust to gather the original events from the sender computers.

Load Balancing

The metrics and suggestions in this section are based on tests performed by quality control.

InTrust agents send events to InTrust servers in batches. By default, the event submission rates are as follows:

- On Windows servers, including domain controllers, a batch file is sent every minute.
- On workstations, a batch file is sent every seven minutes.

There are two primary limits to consider when estimating if an InTrust server can cope with its load. On the one hand, an InTrust server can gather from no more than 10,000 computers (servers or workstations) at a time. On the other hand, an InTrust server should not receive more than 60,000 events per second in a steady stream. The rate of events from a computer depends very much on the number of data sources that are processed on that computer.

For example, a collection of about 3000 computers with 5 data sources each, 4 events per second per data source, produces a combined stream of 60,000 events per second. This is a load that a 16-core InTrust server with SSD storage and 16GB of memory should handle without problems.

Tips on avoiding excessive workload on a server:

- Keep track of how many computers there are per InTrust server.
- Add InTrust servers if necessary.
- Assign different servers to different collections.
- Distribute the computers among your collections evenly.

! CAUTION: **When adding an InTrust server to your existing organization, you should run InTrust setup under an account that can manage the InTrust configuration. The account used for installing the first InTrust server automatically has these privileges. To add InTrust organization administrators, in InTrust Deployment Manager click Manage | Configure Access. Of course, to add organization administrators, you must be an organization administrator yourself.**

Example: Configuring Logon and User Session Auditing

InTrust lets you gather two types of data related to users logging on and off computers:

1. Native Windows Security log events
   These events provide basic logon and logoff information, but contain no indication of the user's presence in the system at any particular time. They only capture the act of logging on and off, and their reliability is limited.
2. User session events enabled by InTrust
   These advanced events contain enough information to help you track not only logons and logoffs, but also when users are actively using computers. For example, they indicate the exact times and durations of terminal sessions connected to domain controllers. User session events are logged locally on computers that have the InTrust agent installed and are in collections where the “InTrust User Session Tracking” data source is enabled.

For logon and user session tracking to be complete, make sure both the “Windows Security Log” and “InTrust User Session Tracking” data sources are enabled in your collections. For details about enabling data sources, see Managing Collections.

Start Gathering

For the purposes of this topic, configure logon event gathering only from domain controllers. Take the following steps:

1. Right-click **Collections** and select **New Collection**.
2. On the General Properties step, give the collection a name indicating that it contains domain controllers.
3. Proceed to the Specify Computers step of the wizard, and add your domain controllers to the list. Make sure the **Install agents automatically** option is selected.
4. On the Data Sources and Repository step, make sure the “Windows Security Log” and “InTrust User Session Tracking” data sources are enabled.
5. Complete the steps.

After this, agents are installed on the domain controllers, and gathering starts automatically.

If you want to watch other computers in addition to or instead of domain controllers (for example, Exchange or file servers), create a new collection and add all the computers you need to it. Configure the gathering options for this collection likewise.

Put Auditing to a Test

To confirm that auditing is working as intended, deliberately perform some of the activity you are watching for on the computers you are watching. Do any of the following:

- Log on to the computers included in the collection and log off
- Lock and unlock the computers
- Set a low screensaver timeout to cause the screensaver to start
- Switch the user

Next, check that your actions have been captured in the repository.

View the Results in Repository Viewer

The InTrust Repository Viewer application lets you explore and analyze the contents of InTrust repositories. To browse the repository you have been collecting to, run Repository Viewer from the Start menu, and click **File | Open Repository**.

In the dialog box that opens, select the **Production repository** option, and proceed to specify the repository you have been working with.

> **NOTE:** A *production repository* is a repository that is available in InTrust Deployment Manager or InTrust Manager. For details about production and idle repositories, see Repository Connections.

The left pane of the Repository Viewer console shows:

- A navigation tree that organizes events by domain and log type
- A collection of predefined search folders with preconfigured popular filters for quick event analysis

You can select any of the search folder nodes or any of the repository hierarchy nodes, and view the events they contain by clicking the **Go** button. For the purposes of this document, the following predefined searches are useful:

- Searches in the **Logons** subfolders of the topmost search folders
- Searches in the **User sessions** subfolders of the topmost search folders

Select one of these searches and click **Go**. If events about your activity are displayed in the right pane, then auditing has been set up correctly.

For detailed Repository Viewer documentation, see Searching for Events in Repository Viewer.

Setting Up Gathering of Syslog Data

You can use the InTrust Deployment Manager console to collect and manage Syslog data that is received by InTrust Server. To enable Syslog data capture, you need to set up a Syslog collection, as follows:

- Specify the InTrust server that should listen for Syslog messages
- Specify the devices you want to audit
- Specify the repository where you want to store the collected Syslog data

You can add, delete and edit collections at any time.

The first time you run InTrust Deployment Manager, you are directed to the welcome page, where you are prompted to create a collection. Take the opportunity to create your Syslog collection.

You can create more collections at any time. For that, right-click **Collections** and select **New Syslog Collection**, and then follow the wizard steps.

Common Tasks for Syslog Collections

To add a Syslog collection

1. In the InTrust Deployment Manager console, go to the **Collections** view.
2. Right-click **Collections** and select **New Syslog Collection**.
3. In the **New Syslog Collection** wizard, specify a name and a description for the collection.
4. On the **Set Up Collection** step, specify the InTrust server from which you want to get Syslog audit data and repository. You can collect Syslog data from all devices that send Syslog messages to the InTrust server or specify certain devices by selecting one of the following options:
   a. **All Syslog data received by InTrust server**
   b. **Syslog data only from devices you specify on the next step**
5. If you select the **Syslog data only from devices you specify on the next step** option, add the devices you want on the next **Specify Syslog Devices** step. For that click the **Add** button and select **Devices**. In the **Specify Syslog Devices** dialog box, you can add devices from the list or specify the IP address (DNS name) of the certain device.
   Also you can upload a text file that contain a list of device IPs, for that click **Add** and select the **Import from file** option. A list file uses the plain text format. Each IP address must be a separate line in the file.

To add devices to a collection

Use any of the following methods:

- In the wizard that opens when you edit a Syslog collection, change the devices list on the **Specify Syslog Devices** step as described in the previous procedure.
- Select the devices you need in the **Syslog devices not in a collection** search folder in the navigation pane and click **Add to collection**, and then select the collection you need.

> ! CAUTION: You cannot add a device from the **Syslog devices not in a collection** search folder to a collection if this collection and this device are related to different InTrust servers.

To delete Syslog devices from a collection

1. Right-click the Syslog collection and select **Edit Collection**.
2. In the wizard that opens, go to the **Specify Syslog Devices** step.
3. In the list of devices, select the devices you do not need, and click **Remove**.

To start a new repository

You can create a repository when you create a new Syslog collection or edit an existing collection, on the **Set Up Collection** step of the wizard. For finer-grained management of repositories, use the Storage view (for details, see Managing Repositories).

Passing Messages On

If both Syslog listening and forwarding are enabled for a repository at once, then incoming Syslog messages are forwarded unchanged. This happens independently of writing the messages to the repository.

Analyzing Syslog Collections

When a Syslog collection is selected, the right pane shows a table with information about the collection members. The table supports multi-level grouping of collection computers, so that you can organize the computers in tree-like views using any criteria. For example, you can group computers by source status, then by collection, then by timestamp.

The device can have **Not Collecting** or **Collecting** status. If the InTrust server does not receive events from the device for half a week - the device changes the status to **Not Collecting**.

The **Timestamp** field contains the time when the last syslog message was generated by a device or time when the last message was received on the InTrust server (If impossible to determine the time when the message was generated). All syslog devices that are located in the **Syslog devices not in a collection** search folder contains the time when the last event was received on the InTrust server in the **Received** field.

To use multi-level grouping, drag table column names from the devices list to the area above the list. The devices list changes accordingly.

Message Parsing Specifics

InTrust parses the Syslog messages it captures to store a useful representation of them in the repository. Only UDP v4 is used for receiving messages, and they can use either ASCII or UTF-8.

Messages are expected to conform to either RFC 3164 or RFC 5424. The fields of an event entry in the repository are filled in from the fields of a Syslog message.

A message is parsed until the end or until a mismatch occurs. The parser breaks down the message into as many insertion strings as it can. No matter how many fields InTrust is able to parse successfully—all of them, just the first three or none at all—the entire message text is saved in the Description field. This enables you to find the message in Repository Viewer (by using the **Any field** parameter) or IT Security Search even if the fields are not mapped properly.

RFC 3164 Specifics

The following pattern is defined in RFC 3164:

```
<PRI>TIMESTAMP HOSTNAME TAG: MSG
```

An example of a valid message is as follows:

```
<34>Oct 14 22:14:15 mymachine su: 'su root' failed for lonvick on /dev/pts/8
```

The **PRI** field indicates the facility and severity. For details, see Treatment of Facility and Severity Information.

A message has the following parts:

Field	Details
PRI	Indicates the facility and severity. For details, see Treatment of Facility and Severity Information.
TIMESTAMP	See Treatment of Timestamps (RFC 5424).
HOSTNAME	The name of the host as returned by the **hostname** command. If it is unknown, the host puts its own IP address in this field.
TAG	This is a piece of data that can help classify the message. It is often followed by the process ID in square brackets. If the process ID is not used, it is followed by a colon.
MSG	The body of the message.

Treatment of Timestamps (RFC 3164)

If the timestamp cannot be parsed, the **Time** event field stores a part of the time that the event was written to the repository (in the InTrust server's time zone). Note that this field is supposed to contain local times. The GMT timestamp is derived from the parsed value. The message contains no time zone information, so it is important that the Syslog device and the InTrust server should best be located in the same time zone; otherwise, the local and GMT timestamps will be wrong.

RFC 5424 Specifics

The following pattern is defined in RFC 5424 (the header is **bolded**):

```
<PRI>VERSION TIMESTAMP HOSTNAME APP-NAME PROCID MSGID STRUCTURED-DATA MSG
```

A message has the following parts:

Field	Details
PRI	Indicates the facility and severity. For details, see Treatment of Facility and Severity Information.
VERSION	Syslog version. The presence of a digit after the **PRI** field is how InTrust can tell this is an RFC 5424-compliant message. However, it doesn't matter which digit it is.
TIMESTAMP	See Treatment of Timestamps (RFC 3164).
HOSTNAME	This can be an FQDN, IPv4 address, IPv6 address or conventional hostname. It can also be omitted with “-”. Examples of valid host names: • Machinename • Myhost.domain.com • 10.30.44.135 • fe80::5d3b:41f:38d2:a1b1%13
APP-NAME	This field identifies the application that sent the message. It can be omitted with “-”. InTrust does not process this data.
PROCID	This field is often used to provide the process name or process ID associated with a Syslog system. It can be omitted with “-”. InTrust does not process this data.
MSGID	This field should identify the type of message. For example, a firewall might use the MSGID "TCPIN" for incoming TCP traffic and the MSGID "TCPOUT" for outgoing TCP traffic. It can be omitted with “-”. InTrust does not process this data.
STRUCTURED-DATA	This is a collection of arbitrary key-value pairs. It can be omitted with “-”. InTrust does not process this data.

Examples of valid messages:

- `<165>1 2015-05-11T22:14:15.003Z SUPERHOST1 myproc 8710 - - %% It's time to make the do-nuts.`
- `<165>1 2003-10-11T22:14:15.003Z mymachine.domain.com evntslog - ID47 [exampleSDID@32473 iut="3" eventSource="Application" eventID="1011"]`
  Message with structured data in the UTC time zone
- `<140>1 2003-10-11T22:14:15.003+3:00 10.30.44.245 evntslog - ID47`
  Message with a non-UTC time zone and IP address instead of host name

For an in-depth description of the format, see Section 6 of RFC 5424.

Treatment of Timestamps (RFC 5424)

The timestamp in a message can contain such details as the time zone and milliseconds. Millisecond information is lost when a message is converted to an event entry. It is also possible that the timestamp is omitted altogether, replaced by “-”.

The following are examples of valid timestamps:

```
2015-05-12T19:20:50.52-04:00
2015-05-11T22:14:15.003Z
2015-05-24T05:14:15.000003-07:00
-
```

The following timestamps are malformed:

`2015-08-24T05:14:15.000000003-07:00`
Too many decimal places (there should be no more than six).

`08-24-2015T05:14:15-07:00`
The order of units in the date is wrong.

`2015/08/24T05:14:15-07:00`
You cannot use separators other than "–" and ":" in the time part.

If the timestamp cannot be parsed or it is omitted, InTrust substitutes the current time during event generation (in the InTrust server's time zone). The parsed (or substituted) timestamp goes to the **Date** and **Time** fields of the event. Note that messages are supposed to contain local times.

The GMT timestamp is derived from the resulting value, as follows:

- If the time zone is specified, it is used for offsetting the GMT timestamp.
- A message must have either time zone information or local offset information; if neither is available, the timestamp cannot be parsed.

Mapping of Event Fields

When InTrust generates an event entry based on a Syslog message, it uses the rules outlined in the table below. It shows what happens to the following example message:

- RFC 3164-compliant format
  `<34>Oct 14 22:14:15 mymachine su: 'su root' failed for lonvick on /dev/pts/8`
- RFC 5424-compliant format
  `<34>1 2014-10-14T22:14:15+03:00 mymachine su - ID47 - 'su root' failed for lonvick on /dev/pts/8`

Event field	Value	In the example above
Log	Syslog	Syslog
Event Type	*Severity value, derived from the* ***PRI*** *field. For details, see Treatment of Facility and Severity Information.* *There are more severities than event types, and they are mapped as follows:* • *0–3: error* • *4: warning* • *5–7: information*	error
Source	Syslog Device	Syslog Device
Category	*Facility value, derived from the* ***PRI*** *field.*	security
Event ID	0	0
Date	*The date the event occurred or was put in the repository. For details, see Treatment of Timestamps (RFC 3164)*	10/14/2014

Event field	Value	In the example above
	or Treatment of Timestamps (RFC 5424).	
Time	*For details, see Treatment of Timestamps (RFC 3164) or Treatment of Timestamps (RFC 5424).*	22:14:15
User	*Not used.*	
Computer	*The **HOSTNAME** field, if it can be parsed. This is the host where the event occurred.* *If the host name cannot be parsed or is omitted, then InTrust substitutes the IP address of the host that the message came from.*	mymachine
Description	*The entire message, restored from the insertion strings it was broken down into.*	<34>Oct 14 22:14:15 mymachine su: 'su root' failed for lonvick on /dev/pts/8 <34>1 2014-10-14T22:14:15+03:00 mymachine su - ID47 - 'su root' failed for lonvick on /dev/pts/8
Insertion String #1	*The host that sent the message; not necessarily the same host that the event occurred on.*	mymachine

Treatment of Facility and Severity Information

In both RFC 3164 and RFC 5424, the PRI field indicates the facility and severity. The following table shows how PRI values are interpreted:

Severity → Facility ↓	emergency	alert	critical	error	warning	notice	info	debug
kernel	0	1	2	3	4	5	6	7
user	8	9	10	11	12	13	14	15
mail	16	17	18	19	20	21	22	23
system	24	25	26	27	28	29	30	31
security	32	33	34	35	36	37	38	39
syslog	40	41	42	43	44	45	46	47
lpd	48	49	50	51	52	53	54	55
nntp	56	57	58	59	60	61	62	63

Severity → Facility ↓	**emergency**	**alert**	**critical**	**error**	**warning**	**notice**	**info**	**debug**
uucp	64	65	66	67	68	69	70	71
time	72	73	74	75	76	77	78	79
security	80	81	82	83	84	85	86	87
ftpd	88	89	90	91	92	93	94	95
ntpd	96	97	98	99	100	101	102	103
logaudit	104	105	106	107	108	109	110	111
logalert	112	113	114	115	116	117	118	119
clock	120	121	122	123	124	125	126	127
local0	128	129	130	131	132	133	134	135
local1	136	137	138	139	140	141	142	143
local2	144	145	146	147	148	149	150	151
local3	152	153	154	155	156	157	158	159
local4	160	161	162	163	164	165	166	167
local5	168	169	170	171	172	173	174	175
local6	176	177	178	179	180	181	182	183
local7	184	185	186	187	188	189	190	191

Searching for Events in Repository Viewer

To browse repositories, use the InTrust Repository Viewer application. This console provides tools for event viewing and on-the-spot audit data analysis. Repository Viewer lets you dispense with SSRS-based reporting if your intention is to examine audit data rather than submit formal reports or provide knowledge for regulations compliance.

The primary feature of Repository Viewer is event searching. Searching supports advanced filtering, grouping and sorting. For your searches to work fast, it is recommended that the repository be indexed. (For more information about indexing, see the Repository Indexing for Advanced Search Capabilities topic.)

You can do the following with the search results:

- Save search criteria as search folders for future use
- Organize the results in a tree using multi-level grouping
- Apply view filters to further refine the scope of data
- Export the results to create an ad-hoc report

In addition, you can schedule a report to be built from an automatic search and have it delivered by email or saved in a network share.

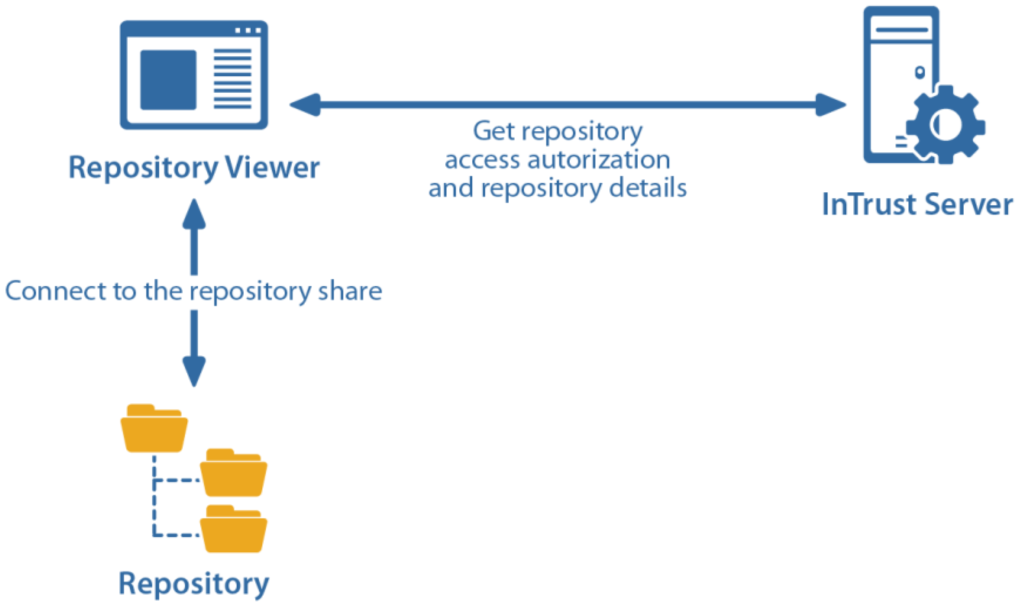
Where to Run Repository Viewer

Repository Viewer does not have complex InTrust component dependencies. However, in the primary use scenario it connects to the repository through an InTrust server, and it matters a lot how far apart the three components are: Repository Viewer, the InTrust server and the repository.

Working with Repository Viewer and InTrust Server

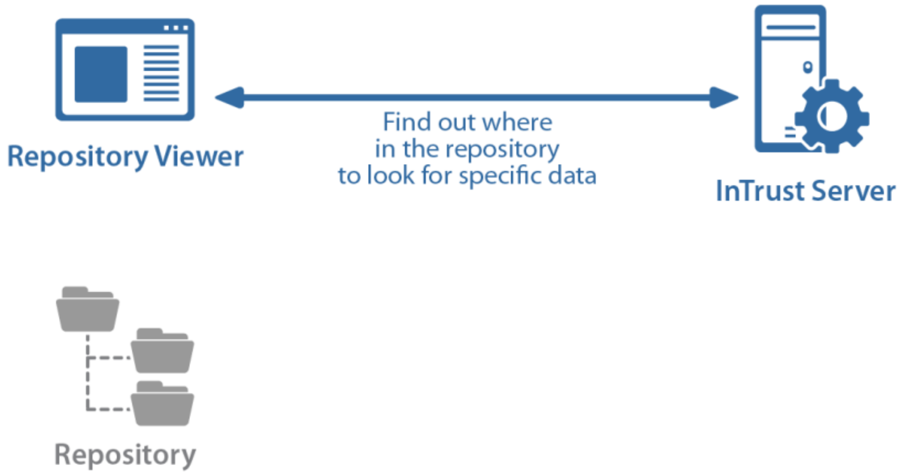
If Repository Viewer opens a repository through an InTrust server, it lets the server manage repository connections.

When Repository Viewer starts working with a repository, it connects to the InTrust server, gets authorization for access to the repository contents, and then connects to the repository.

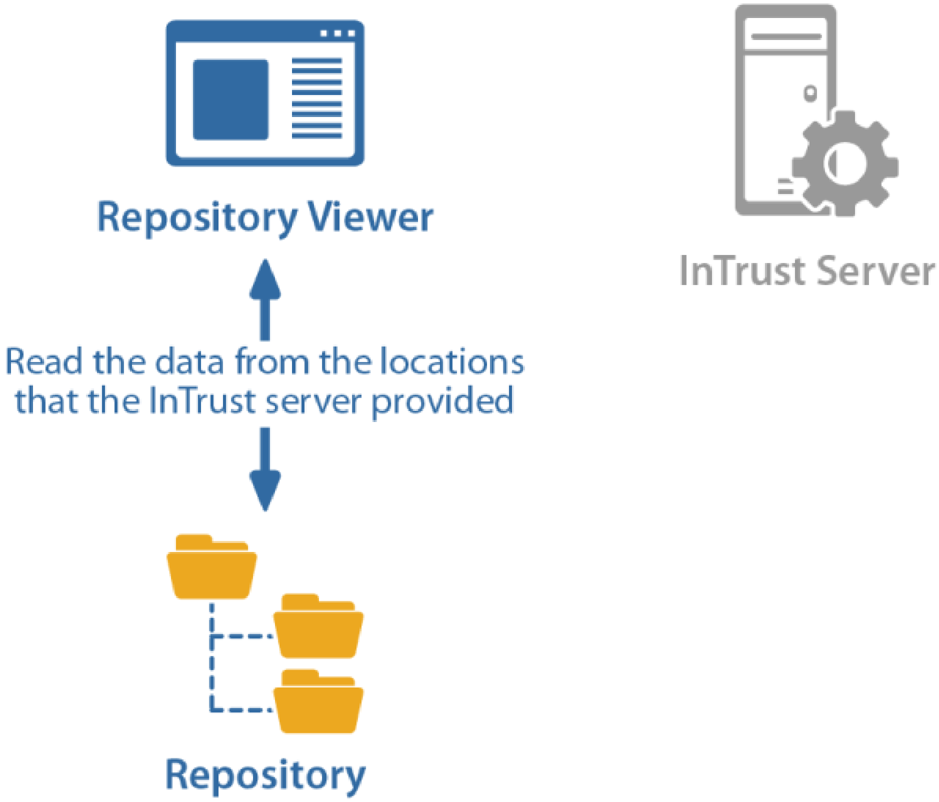


As Repository Viewer continues to work with the repository, it repeats the following steps:

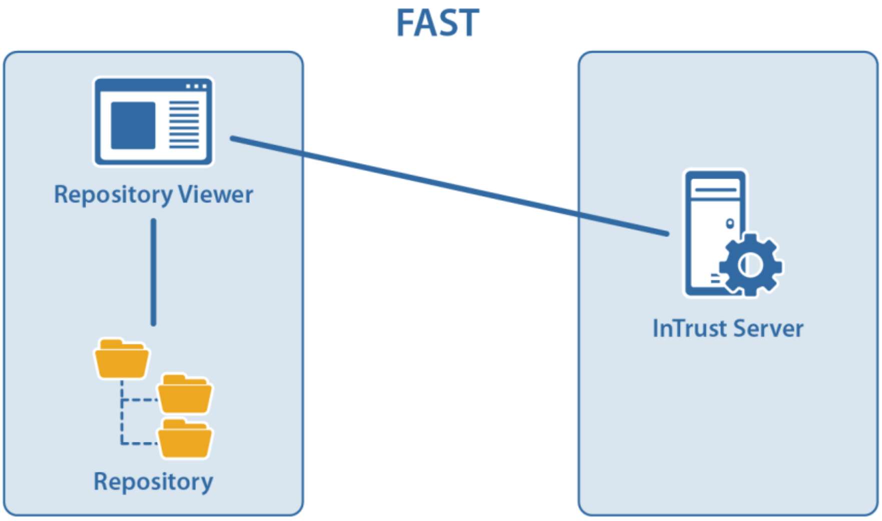
1. Ask the InTrust server for the exact locations of the requested data in the repository structure.

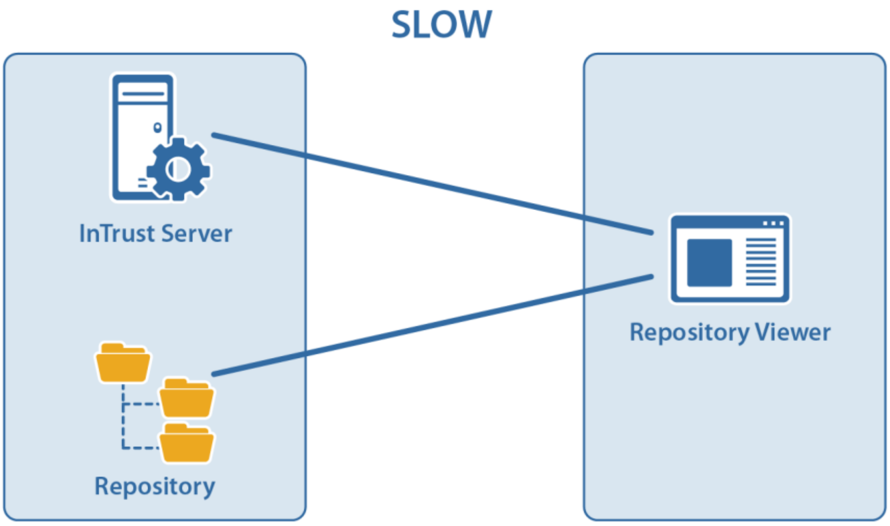


2. After this negotiation, read the data directly from the repository, using the information from the server.


Repository Viewer
InTrust Server
Read the data from the locations that the InTrust server provided
Repository

The actual reading of repository data is the most traffic-intensive part of the process. Therefore, you should try to run Repository Viewer as close as possible to the repository share, especially in geographically-dispersed networks. Ideally, they should be on the same computer, but if that is not possible, you should run Repository Viewer on a computer or virtual machine located in the part of the network that is nearest the repository share location. How close Repository Viewer is to the InTrust server is far less important, because the amount of data they exchange is insignificant.





Working with Repository Viewer without an InTrust Server

You can use this option to analyze data from an idle repository; for example, a backup copy of a production repository with historical data.

Getting Started with Repository Viewer

ℹ **NOTES:**

- When you launch Repository Viewer for the first time, the console asks you to specify the repository to look in.
- Repository Viewer remembers the most recently used repository and opens it automatically on startup.

To open a repository, click **Repositories | Open** in the main menu. You are prompted to select what kind of repository to connect to: idle repository or production repository. These options mean the following:

- **Production repository**
  This ensures that the InTrust server you specify handles the communication between Repository Viewer and the repository. Always use this option if the repository you need is managed by an InTrust server and is available for gathering, consolidation and other operations. This method does not lock down the repository index, and multiple instances of Repository Viewer can use its index simultaneously.
- **Idle repository**
  This makes Repository Viewer read data directly from the repository without any intermediary components. Use this option only when the repository you need is not attached to any InTrust server. For example, it can be a backup copy of a production repository or an idle repository with historical data. Note that using direct connection locks the index of a repository so that only the first-connected instance of Repository Viewer can use the advantages of indexing.

Production repositories can be grouped together to form *repository groups*. A repository group acts as a single unit: you can run searches on it and create reports as if it were a regular repository. For details about repository group membership, see Managing Repository Groups.

NOTE: Repository Viewer works with repository groups concurrently, but multi-repository searching is not completely overhead-free.

Repository groups are stored in InTrust configuration, and they are available to every instance of Repository Viewer connected to the InTrust organization.

To open a production repository or repository group

1. Select whether you want to connect by specifying an InTrust organization or a specific InTrust server.
2. Select the organization or server.
3. Select whether you want to open individual repositories or a repository group.
   The following happens for individual repositories:
   - If you select a single repository, it will open in a temporary group. If there is still one repository in the group by the time you finish the session, the group is not saved in InTrust configuration.
   - If you select multiple individual repositories or repository groups, a new group will be created for them, and the group will open. It will include all members in your selection.

   If you select a repository group, that group will open.

You should always use the index if it is available and up to date. The index makes Repository Viewer operation interactive.

NOTES:

- For access to a production repository, Repository Viewer must be running under any of the following:
  - An account that is listed as an organization administrator.
  - An account which has at least **Read** permissions on the repository and index and is a member of the computer local **AMS Readers** group on the InTrust server that manages the repository (or repositories) and on the InTrust server that Repository Viewer connects to (these may be two different servers).
- Make sure all InTrust servers in the organization have the agent communication port (900 by default) and InTrust Server management port (8340 by default) open for inbound traffic.
- If Repository Viewer connects from a remote computer, inbound TCP ports 1024 to 65535 must be open on that computer for communication with the InTrust server.
- After you have opened a repository or repository group from some InTrust organization, there is a quick way to open other repositories from the same organization. For that, click **Repositories | Change**.

To open an idle repository

1. Specify the local or network path to the repository root folder.
2. To use the index of the repository, in the **Index location** group of options select **Repository folder** or supply a path in the **This location** text box. To continue without an index, select **No index**.

NOTE: For access to an idle repository, Repository Viewer must be running under an account with at least **Read** permissions on the share that contains the repository.

Once you have opened a repository or repository group, the left pane shows the following:

- A navigation tree with the repository structure
  The tree represents the repository structure using multiple levels, such as environment (Microsoft Windows or Unix), domain (for Windows only) and computer, down to the event batch file.
- Predefined search folders with search condition presets
  These are essentially built-in interactive reports. For details, see Predefined Searches.
- Custom search folders
  These are search folders that you create yourself, either based on existing ones or from scratch. For details, see Custom Searches.

The right pane contains search tools.

> **NOTE:** Any tab can be detached and docked freely in the right pane. To detach a tab, drag it away from where it is docked. To dock a pane, drag it onto any of the areas of the view compass that appears. To make it a tab again, right-click its caption and select **Tabbed Document**.

Running Searches

To run a search, click **Go**. The context of your search depends on the following:

1. Where in the navigation tree you are
   Selecting a node in the navigation tree means that your searches will include only the events available at that node's level. For example, to look in the entire repository group, select the repository group node; to get events only from a particular repository or computer, select that repository or computer's node.
2. Whether you are using any parameter filters
   Running the search without any parameters will show you all events at your current navigation tree level. If you add any filters, they are applied during the search. If you have selected any search folder in the left pane, you are already using the filter set configured for that search folder.

By default, the number of search results that can be displayed at once is capped at 5000. If you reach this limit, consider specifying better filtering conditions. You can also change the search result limit on the **Search Filter** tab.

> **NOTES:**
>
> - The higher the search limit, the more memory is used by Repository Viewer. If you want to increase the search result limit beyond 5000, do it with caution.
> - Use filtering by date whenever the date range is known. This speeds up searches considerably.

Predefined Searches

Repository Viewer provides an extensive set of preconfigured search folders out of the box. They will likely cover most of your event analysis needs; consider trying these searches before you begin creating your own. To view and use the searches included by default, expand the **Predefined Search Folders** node. Predefined search folders are available only when you are working with production repositories.

ℹ **NOTES:**

- Predefined searches are stored in the InTrust configuration database.
- Predefined searches are updated from one InTrust version to another. This can cause upgraded Repository Viewer to fail to find events that the old version was able to find. For details, see Changes to Event Fields. Events gathered to the repository after the InTrust upgrade are fully compatible with the updated predefined searches.

You can freely modify these search folders in the **Search Filter** tab (see Filter Parameters for details). However, any changes you make are applied only for the current session. The next time you open Repository Viewer, predefined search folders will be in their default state. If you want to save your changes permanently, make a copy of the modified search folder using the **Copy To** button in the toolbar of the **Search Filter** tab . A predefined search folder can be a convenient starting point for creating your own search folder.

ℹ **NOTE:** The **Copy To** button is available only when an existing search folder is selected. When the filter parameters are configured from scratch, the button is labeled **Save As**.

In addition to the search filter configuration, the saved search folder includes the event list layout. If you have configured grouping and sorting for the search (see Configuring the Result Layout for details), these settings are preserved.

After you have saved your own search folder, all subsequent changes to it are applied immediately and permanently. See also the Custom Searches topic.

Changes to Event Fields

The set of fields in events stored in the InTrust repository has been expanded from version to version. Predefined searches in Repository Viewer have kept up with those changes and incorporated the newly-added fields. As a result, predefined searches may not always work as expected on event data that was collected by older versions of InTrust. This topic lists the added fields by InTrust version.

If your search unexpectedly turns up too little old data, you may want to modify the search to exclude recently implemented fields.

Added Between 10.5 and 10.6

Field Name	Field Display Name
Affected_Group	Affected Group

Added Between 10.6 and 10.7

Field Name	Field Display Name
Filer	Filer
New_path	New path
Scope	Scope
Number_of_results	Number of results
Query_filter	Query filter

Field Name	Field Display Name
Attribute_name	Attribute name
Elapsed	Elapsed
Query_type	Query type
TPAM_Operation	Operation
TPAM_Role	Role
TPAM_Target	Target
TPAM_Failed	Failed
UNIX_Result	Result
UNIX_OS	OS
QPMU_Service	Service
QPMU_Master_host	Master host
QPMU_Submit_host	Submit host
QPMU_Submit_user	Submit user
QPMU_Run_host	Run host
QPMU_Run_user	Run user
QPMU_Command_line	Command line
Permissions_Changed	Permissions Changed
Original_Owner	Original Owner
New_Owner	New Owner
Data_Written	Data Written
Permission_level_name	Permission level name
Permission_level_allow_mask	Permission level allow mask
Permission_level_deny_mask	Permission level deny mask
Site_URL	Site URL
List_URL	List URL
List_relative_URL	List relative URL
User_Logon_Name	User Logon Name
Applied_to	Applied to
Inherited_from	Inherited from

Field Name	Field Display Name
Version	Version
Grantee_user_name	Grantee user name
Grantee_group_name	Grantee group name
Field_Name	Field Name
Old_value	Old value
New_value	New value
Attachment_file_name	Attachment file name

Added Between 10.7 and 11.0

Field Name	Field Display Name
UNIX_AUDIT_NAME	Audit Event
UNIX_AUDIT_CLASS	Audit Class
UNIX_AUDIT_CALL	Audit Call
UNIX_AUDIT_TRAIL	Audit Trail
UNIX_AUDIT_COMMAND	Audit Command

Added Between 11.0 and 11.0.5

None.

Added Between 11.0.5 and 11.1

Field Name	Field Display Name
Facility	Facility
Object_New_DN	Object New DN
Object_Old_DN	Object Old DN
Severity	Severity

Custom Searches

If the predefined Repository Viewer search folders do not cover your specific needs, use custom searches: either based on the predefined ones or created from scratch.

IMPORTANT:

- Starting with InTrust 11.0, custom searches are stored in the InTrust configuration database in a revised format. If you have upgraded InTrust, you have the option of migrating your existing custom searches.
- To create custom searches, you need to make sure your account is an InTrust organization administrator. To view and edit the list of organization administrators, do one of the following:
  - In InTrust Deployment Manager, click **Manage | Configure Access**.
  - In InTrust Manager, open the properties of the root node.

  The default organization administrators are the accounts used for installing InTrust and for running InTrust services.

Ad-Hoc Searches

To run an ad-hoc search with parameters, use the **Search Filter** tab, which is under the event list in the default layout. The **Add or Remove Parameters** button lets you customize your search, as follows:

1. Click **Add or Remove Parameters**.
2. In the Select Filter Parameters tool bar that opens, select the parameters that you want to define for the filter. See Filter Parameters for details.
3. When you have added the necessary parameters, close the Select Filter Parameters tool bar, and specify the values you want to filter by and the operators to use for value matching.
4. Click **Go**.

If you expect to use the same set of parameters in the future, you can save it as a custom search folder. For details, see Custom Search Folders below.

Custom Search Folders

Any search filter configuration can be saved as a search folder. You can make custom search folders:

1. By modifying predefined search folders and saving your changes, as described in the Predefined Searches topic. This method can save you a great deal of time and effort.
2. By building a set of filters from scratch when only a node in the navigation tree is selected, and saving this.

To create a search folder based on your current filter configuration and place in the navigation tree, click **Save As** in the **Search Filter** tab when it shows your filter settings, and specify the name of the new search folder in the dialog box that appears.

NOTE: The **Save As** button is available only when the filter parameters are configured from scratch. When an existing search folder is selected, the button is labeled **Copy To**.

Mind that the node currently selected in the navigation tree can affect the set of parameters defined for the search folder. For example, if a particular computer is selected, an additional parameter will be automatically added to show events only from this computer. If you want to avoid this, create search folders while the root folder of the repository is selected.

NOTE: Each user's custom search folders are saved in the InTrust configuration database. They are available to all InTrust organization administrators (for reading and writing) and members of the **AMS Readers** local group on the repository-managing InTrust server (for reading).

Organizing Search Folders

To logically nest search folders, organize them into containers:

- To create containers for your search folders in advance, right-click **Custom Search Folders** in the left pane and select **Create Container**.
- To create a container while saving the search folder, click the folder icon in the **Save As** dialog box.

Best Practice: Search Across Event Fields

If you want to find specific information no matter which event field it is in, use the **Any Field** parameter for your search term. This is especially helpful if you are not familiar with the information layout in the events you are working with.

To find this parameter in the Select Filter Parameters dialog box, select the **Primary** option in the drop-down list. **Any Field** is the first item in the list.

Generally, this is a good starting point for refining a search: it let you exclude the fields where you don't want the term to occur instead of trying to include all the fields where it might occur.

Managing Repository Groups

After you have loaded a repository group into Repository Viewer, you can manage its membership as follows:

- Using the **Remove** command in the member repository shortcut menu
- Using the **Add Repository** command in the group shortcut menu

The shortcut menu for a repository group also contains the **Rename Repository Group** and **Delete Repository Group** commands. The **Delete Repository Group** command erases the group from InTrust configuration. The other place where you can delete a repository group is in the Open Repositories wizard; all existing repository groups in the InTrust organization are listed there.

IMPORTANT: Whenever a repository is added to a group or removed from it, the change is immediately applied in all instanced of Repository Viewer connected to an InTrust organization. These changes should be made responsibly.

Filter Parameters in Repository Viewer

Repository Viewer provides a variety of fields to look in. To list all of them, select **All** in the drop-down list in the Select Filter Parameters toolbar. By default, only the normalized fields (such as Who, When or What) are shown.

The parameters include:

1. Regular event fields (available in the Primary set and under All)
2. Additional parameters:
    - The **Insertion strings** set
      These are the unnamed insertion strings that events use for storing various information. You can use these fields if you know precisely what they are used for in the events you are working with.
    - The **Resolved insertion strings** set
      These are regular insertion strings that have been processed to resolve any GUIDs and SIDs that occur in them. Note that the resolution works only for events that were gathered using InTrust agents.
    - The **Named insertion strings** set
      These are friendly labels for regular insertion strings. Note that different types of events use identically-numbered insertion strings for different kinds of data, so you should make sure the meaning is right if you use a named insertion string in your search. Named insertion strings are intended for improving presentation, especially if you are preparing custom searches for someone else to use.
    - The **Normalized event fields** set
      See Normalized Event Fields (Who, What, When and Others) for details.
    - The **Any Field** parameter
      See the *Best Practice: Search Across Event Fields* section in Custom Searches for details.
    - The **Custom** parameter
      See Advanced Expression-Based Filters for details.

Configuring Parameters

When you have added a parameter to the **Search Filter** tab, specify the following:

1. The operator to apply
   Use the leftmost button in the operator block. The operators are "Equals", "Contains", "Ends with" and so on.
2. The parameter value
   This is a combo box where in addition to an explicit value, this can be one of the following options:
    - **Blanks**
      Matches if the field is empty.
    - **NonBlanks**
      Matches if the field is not empty.
    - **Custom**
      Lets you build a logical condition tree that works within this particular parameter; see below for details.

> **NOTE:** In the current version of Repository Viewer, the following issues are known to exist in search filters:
>
> - The value used for the Any Field parameter matches only the beginnings of words.
> - The "Contains" operator matches only the beginnings of words.

All the parameters you include in the filter are combined using logical AND—they must all match for the filter as a whole to match. For details about using OR operations, see Advanced Expression-Based Filters.

! **CAUTION: For some search filter operators, there is no search speedup if the repository is indexed. The following operators cannot take advantage of the index:**

- **Not equals**
- **Does not contain**
- **Not like (wildcards)**
- **Does not start with**
- **Ends with**
- **Does not end with**

Custom Logic for Parameters

Selecting **Custom** in the parameter value combo box opens a dialog box that lets you set up multiple matching conditions and manage their flow with the AND and OR operators.

- To change the list, use the **Add Condition** and **Remove Condition(s)** buttons.
- To select conditions, use the leftmost column: you can Ctrl-click, Shift-click and drag-select items.
- To apply the AND operator (meaning, match all of them) to selected conditions, click the 'And' Group button. The grouping will be visualized as a blue line that spans the operators.
- To apply the OR operator (meaning, match any of them) to selected conditions, click the 'Or' Group button. The grouping will be visualized as an orange line that spans the operators.
- To change a group's operator from OR to AND or the other way around, click the line that marks the grouping, or select a member of the group and click the Toggle button.
- To remove one or more conditions from a group, select them and click the **Ungroup** button.

Note that this logic is processed for values of a single parameter. If you want to analyze multiple parameters, see Advanced Expression-Based Filters for details.

Normalized Event Fields (Who, What, When and Others)

These fields are not present in the original events; they are filled in by InTrust based on knowledge about the contents of regular fields in various types of events. Normalized fields make it easier to retrieve the most important information from the event; you do not have to know which particular original fields contain which kind of information.

The current set of supported normalized fields is as follows:

FIELD	MEANING
What	A brief description of what the event is about. It is related to such fields as **Description** and **Category**. Example: For all events that have to do with logging on, the **What** field says **Logon**, regardless of the event category, platform where it occurred, or nature of the logon.

FIELD	MEANING
When	When the event was generated. The time is automatically converted to the local time on the computer where Repository Viewer is running.
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 a configuration change) was performed. This is not necessarily the same computer as the one where the activity had effect.
Who	Plain user name of the account that caused the event. Example: Using this field helps you track user activity across platforms: Windows, Unix, VMware and so on.
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. Example: In password change events, this field shows whose password was changed.

NOTE: Use Event-o-Pedia (http://eventopedia.cloudapp.net/) to learn more about the events you can audit. This Web site is a knowledge base that helps you find out the meaning, structure and importance of the events you encounter.

Advanced Expression-Based Filters

The **Custom** filter parameter lets you specify expressions for very specific filtering needs that cannot be covered by the built-in options (for example, complex time ranges). The parameter accepts expressions in the REL expression language, which is used for event analysis throughout InTrust. The language is described in the InTrust Customization Kit document.

The immediate and intuitive advantage of custom expressions is the ability to use logical OR across multiple fields to branch your matching conditions. Effectively, this lets you combine multiple searches.

Examples of expression-based filters:

What you want to find	Expression
Events where the **Computer** field is "SRV01" or the **User Name** field is "DOMAIN1\jdoe", but not necessarily both at once.	`(Computer = "SRV01") or (UserName = "DOMAIN1\\jdoe")`
Events where the **Who** field is an account that is a member of the **Domain Admins** group.	`member_of( Who, 'Domain Admins', true)` **Important:** This expression works only for global and universal groups, not for domain local groups. It is suitable in this case, because **Domain Admins** is a global group.

For more advanced REL techniques, refer to the InTrust Customization Kit.

Changing the Business Hours and Non-Business Hours Parameters

The **Business Hours** and **Non-Business Hours** parameters define fixed time patterns, and no user interface is provided for editing these patterns. If you need to adjust the hours for a particular search folder, you can do so using native SQL Server tools, as follows:

1. Run an SQL query on the InTrust configuration database to find the search folder you need. For example:
   ```
   select [Guid], [Query] from [dbo].[SearchItem] where [name] = '<search_folder_name>'
   ```
   This returns the GUID of the search folder and the search query that it uses. Here is a sample search query:
   ```
   <SearchQuery>
     <SimpleCriterias>
       <SimpleCriteria>
         <name>When</name>
         <condition>
           <GroupOperator>And</GroupOperator>
           <Items>
             <DateTimeComparisonCondition_BusinessHours>
               <start_time>8</start_time>
               <end_time>19</end_time>
               <start_dow>1</start_dow>
               <end_dow>5</end_dow>
             </DateTimeComparisonCondition_BusinessHours>
           </Items>
         </condition>
       </SimpleCriteria>
     </SimpleCriterias>
     <FullTextSearchCriteriaItem>
       <FTS/>
     </FullTextSearchCriteriaItem>
   </SearchQuery>
   ```
2. Edit the search query so that it meets your requirements. You need to make changes to the contents of the **DateTimeComparisonCondition_BusinessHours** or **DateTimeComparisonCondition_NonBusinessHours** node. In particular, you need to modify the integer values of the following:

   - **start_time**
     What time the business or non-business hours start
   - **end_time**
     What time the business or non-business hours end
   - **start_dow**
     The first work day in the case of business hours; the first day off in the case of non-business hours (0 through 6 is Sunday through Saturday)
   - **end_dow**
     The last work day in the case of business hours; the last day off in the case of non-business hours (0 through 6 is Sunday through Saturday)

NOTE: It is assumed that the times you specify are in the time zones of the computers where the events were logged. If you want these original timestamps to appear in Repository Viewer and scheduled reports, make sure the **Local Time** column is displayed in the grid. This column is hidden by default. For details about changing the grid, see Configuring the Result Layout.

3. Overwrite the original search query with your modified version in the configuration database, using the previously extracted GUID to identify the search folder. For that, use an SQL query like the following:
   `update [dbo].[SearchItem] set [Query] = '`*`<modified_search_query_string>`*`' where [Guid] = '`*`<search_folder_GUID>`*`'`

Examining Event Details

To view the details of a selected event, use the **Event Details** tab. Double-click the event to open this tab.

To copy the details, right-click anywhere in the tab and click **Copy to Clipboard**.

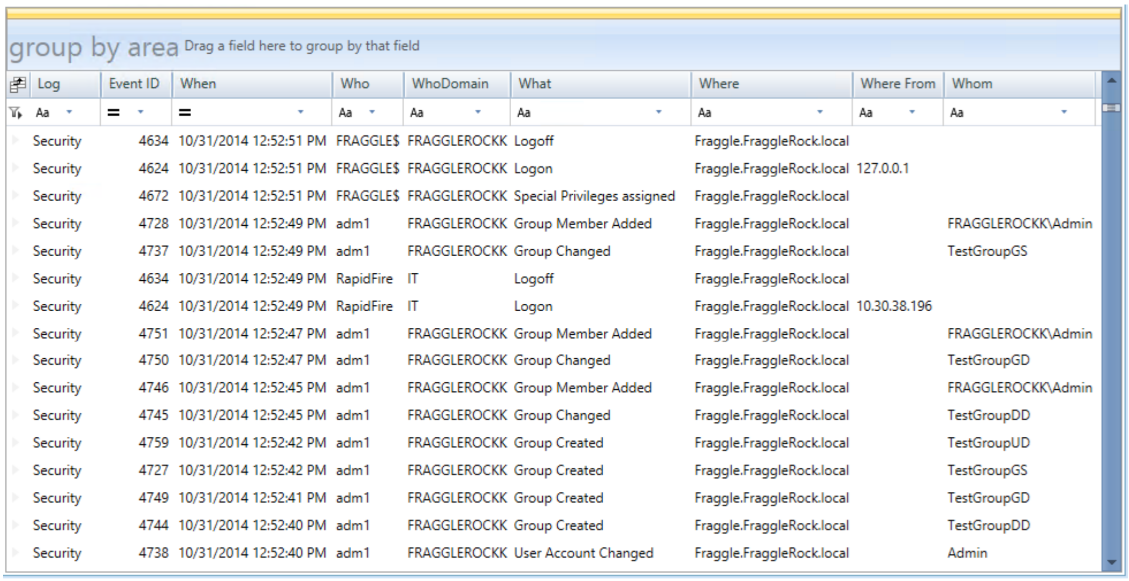
Configuring the Result Layout

You can set up event display in the right pane exactly the way you want your search results to be presented, using sorting and grouping.

Organizing the Grid

The default event view in Repository Viewer is a grid, and the default grid layout is a table, where the columns are named after event fields.

You can snap the column names together like building blocks, vertically as well as horizontally, to make compact layouts instead of using a plain table. The grid will use your block layout for every event it displays.



Log	Event ID	When	Who	WhoDomain	What	Where	Where From	Whom
Aa	=	=	Aa	Aa	Aa	Aa	Aa	Aa
Security	4634	10/31/2014 12:52:51 PM	FRAGGLE$	FRAGGLEROCKK	Logoff	Fraggle.FraggleRock.local		
Security	4624	10/31/2014 12:52:51 PM	FRAGGLE$	FRAGGLEROCKK	Logon	Fraggle.FraggleRock.local	127.0.0.1	
Security	4672	10/31/2014 12:52:51 PM	FRAGGLE$	FRAGGLEROCKK	Special Privileges assigned	Fraggle.FraggleRock.local		
Security	4728	10/31/2014 12:52:49 PM	adm1	FRAGGLEROCKK	Group Member Added	Fraggle.FraggleRock.local		FRAGGLEROCKK\Admin
Security	4737	10/31/2014 12:52:49 PM	adm1	FRAGGLEROCKK	Group Changed	Fraggle.FraggleRock.local		TestGroupGS
Security	4634	10/31/2014 12:52:49 PM	RapidFire	IT	Logoff	Fraggle.FraggleRock.local		
Security	4624	10/31/2014 12:52:49 PM	RapidFire	IT	Logon	Fraggle.FraggleRock.local	10.30.38.196	
Security	4751	10/31/2014 12:52:47 PM	adm1	FRAGGLEROCKK	Group Member Added	Fraggle.FraggleRock.local		FRAGGLEROCKK\Admin
Security	4750	10/31/2014 12:52:47 PM	adm1	FRAGGLEROCKK	Group Changed	Fraggle.FraggleRock.local		TestGroupGD
Security	4746	10/31/2014 12:52:45 PM	adm1	FRAGGLEROCKK	Group Member Added	Fraggle.FraggleRock.local		FRAGGLEROCKK\Admin
Security	4745	10/31/2014 12:52:45 PM	adm1	FRAGGLEROCKK	Group Changed	Fraggle.FraggleRock.local		TestGroupDD
Security	4759	10/31/2014 12:52:42 PM	adm1	FRAGGLEROCKK	Group Created	Fraggle.FraggleRock.local		TestGroupUD
Security	4727	10/31/2014 12:52:42 PM	adm1	FRAGGLEROCKK	Group Created	Fraggle.FraggleRock.local		TestGroupGS
Security	4749	10/31/2014 12:52:41 PM	adm1	FRAGGLEROCKK	Group Created	Fraggle.FraggleRock.local		TestGroupGD
Security	4744	10/31/2014 12:52:40 PM	adm1	FRAGGLEROCKK	Group Created	Fraggle.FraggleRock.local		TestGroupDD
Security	4738	10/31/2014 12:52:40 PM	adm1	FRAGGLEROCKK	User Account Changed	Fraggle.FraggleRock.local		Admin

You may want to hide the fields you do not need or display the blocks that you want to work with. For that, click the icon next to the leftmost block name and change the selection in the **Field Chooser** toolbar. The following fields are available:

- Normalized event fields
- Regular event fields (available in the **Primary** set and under **All**)
- Insertion strings
- Named insertion strings
- Resolved insertion strings

For details about the fields, see Filter Parameters.

Grouping

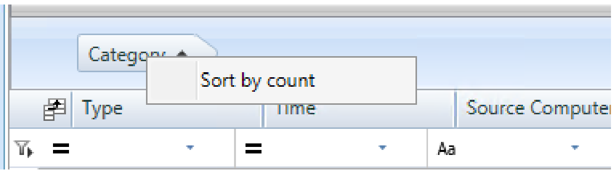
Repository Viewer supports multi-level grouping of events, so that you can organize the results in tree-like views using any criteria. For example, you can group events by log, then by event ID, and then by user.

To use multi-level grouping, In the **Events** pane, drag column names from the event list to the area above the event grid. The event list changes accordingly.

Sorting

To sort the results by a particular field, click that field's block in the grid. Clicking a block repeatedly toggles between ascending and descending order.

Items are sorted by name. However, for groups you also have the option of sorting items by count. To enable it, right-click the block you need in the grouping area and select **Sort by count**.



This option is set independently for each grouping level.

Hiding and Unhiding Events

Hiding and unhiding events is useful when you need to repeatedly locate specific events in the same pool of audit data. This does not change your list of search results, but only specifies which parts of it are shown. It is quicker than redefining search filters and redoing searches every time, and if you are using a search folder, it helps you avoid modifying it.

To configure a view filter, use the controls underneath the column names in the event view: click the operator icon to select the operator, and specify the value to filter by. For details about operators, see the Filter Parameters topic.

Saving the Results

In any event view, you can export the currently displayed events to a file. For that, click **Report | Save Report** button. In the save dialog box, you have the options of saving the current grid "as is" or running a fresh search without an item limit and possibly with more recent results.

The **Report** drop-down menu also contains scheduling options. For details about scheduled reporting, see Reporting on Events Using Repository Viewer.

Using Pie Charts and Column Graphs

Pie charts and column graphs are graphical alternatives to the grid-based textual representation of search results.

An event list can use multi-level grouping, but pie charts and column graphs work only if single-level grouping is used. In addition, the charts are most informative when they have only a few elements to display. Otherwise, the visual clutter can make them useless.

To switch to a non-default event view, select the **Pie Chart** or **Column Graph** tab.

> **NOTE:**
>
> A pie chart or column graph cannot be saved to a file. You can only view it in Repository Viewer.

Case Study: Forensic Analysis of Active Directory Tampering

This example is based on an actual investigation, but the details have been changed. In the example environment, a business-critical server named **acc05** hosts the payroll in a network share. Access to the share is controlled through share permissions. Only the members of the **Finance and Accounting** Active Directory group have read and write access. Jake, the investigator, has grounds to suspect that some of the payroll files have been tampered with, and needs to perform forensic analysis. Here is how he does it using the InTrust-collected audit data from the Security log and Change Auditor File Access Audit event log:

Jake, the investigator, has grounds to suspect that some of the payroll files have been tampered with, and needs to perform forensic analysis. Here is how he does it using InTrust-collected audit data from the Security log and Change Auditor File Access Audit event log:

1. 1. The starting point is the **acc05** computer where the breach supposedly happened. In Repository Viewer, Jake runs a search that shows events from the computer for the past 24 hours. The filter parameters are as follows:
   - Computer: “acc05”
   - When: “Last 1 day”
2. He groups the results by **Who** then by **What**, and checks who accessed the share. In the Where From field, he spots an IP address that needs looking into.
3. Jake checks what else was done from the same IP address. For that, he runs a new search with the **Any Field** parameter set to the suspicious IP address. He finds out that a logon to a domain controller from the suspicious IP address occurred under an administrator account. Jake notes the time of the logon.

4. He then finds out what the administrator account did after the logon to the domain controller. For that, he runs a new search with the **Who** parameter set to the administrator account name and the **When** parameter set to after the logon.
5. It turns out that the impersonator cleared the Security log in an attempt to cover the tracks. However, the events from the log were not lost, because the InTrust agent on the domain controllers was running with log backup enabled.
6. It also turns out that user **david_shore** was added to the **Finance and Accounting** Active Directory group and removed from it shortly afterwards. This is the apparent intruder. To confirm it, Jake checks if this account did anything to the payroll files.
7. He runs a new search with the following parameters:
    - Computer: “acc05”
    - When: “Last 1 day”
    - Who: “david_shore”
8. The search turns up changes to the payroll files. This is clear evidence of a breach, and the perpetrator is now known.

Reporting on Events Using Repository Viewer

In addition to interactive work, Repository Viewer can be used for running scheduled reports based on repository contents. Scheduled reports are essentially searches that have been configured in advance and run automatically at regular intervals.

Therefore, the same considerations mostly apply to scheduled reports as to regular searches (see Searching for Events in Repository Viewer for details).

Scheduled reports work only on production repositories, not on idle repositories. For details about the difference between them, see Repository Connections.

> ! CAUTION:
>
> **At this time, to set a schedule, you need to start with a custom search. You cannot schedule a report based on repository tree browsing results or a predefined search. If you want a scheduled report based on a predefined search or your current event view configuration, first save the settings using the Copy To or Save As button in the results pane. For details, see the Predefined Searches topic.**

To configure a scheduled report

1. Select the custom search you need in the treeview and click **Report | Schedule Report** in the results pane.
2. On the first step of the wizard that opens, specify the time range that the report should cover.
   If you are setting up a report with the most recent events going back a specific time period, it is important to pick the right keyword:
   - Use **Last** to specify a period that starts with the beginning of a complete time unit and ends with the end of a complete time unit. For example, a report with a "last 7 days" time range that runs early on Monday will contain events from 12:00 AM the previous Monday to 23:59 PM on Sunday. The **Last** keyword is recommended for reports that run regularly, because it helps make sure that no results are lost between consecutive report runs.
   - Use **This** to specify a period up to the time the report generation begins. This is the same behavior as during searches, but the option should be used with caution for reports. There is no telling when exactly the report will really start building—it may be minutes after the time specified by the schedule. Therefore, the **This** keyword is not recommended for reports that run regularly, because there might be gaps in event continuity from report to report.
   - The **Before** and **Between** keywords do not make much sense in a report. They are best used for one-off searches that you can export to files.
3. Specify the type of report that you want. Depending on the layout in the event grid, you may have a choice of presentation. The **Table** type is always available and has the same layout as the grid. The **Pie**

Chart and **Column Graph** types are available only if data in the grid is grouped by exactly one field.

> **NOTE:** The **Pie Chart** or **Column Graph** choice is selected automatically if you have clicked **Report | Schedule Report** on the **Pie Chart** or **Column Graph** tab in the results pane, respectively.

4. Specify the desired file format and the delivery method for the report: whether to send it by email, save it in a network share, or both.

> **NOTES:**
>
> - Not all formats are available for all report types. For example, a pie chart cannot be saved to CSV.
> - If you select the CSV format, grouping and sorting settings will be ignored. Your report will contain a plain table of events sorted by time in descending order.
> - CSV is the only format without limits on the number of included events. For all other available formats, the number of entries is capped at one million.

   If you select to send the reports as email attachments, note the following:

   - You can change SMTP settings for email delivery under the list of recipients.
   - Consider setting the maximum attachment size to avoid putting unnecessary load on the SMTP server.
   - If you expect the report files to be large, consider using both delivery methods instead of just email.
   - In the event of email delivery failure due to an exceeded maximum attachment size, the specified recipients get a notification message about this.
   - The report recipients you specify will get not only the resulting reports, but also any messages about possible reporting failures.

5. Set the schedule for the regular report runs. You can specify a very precise pattern. Note that if a lot of reports happen to be scheduled for the same time, they are queued to run one after another, and the start of your report run may be delayed.
   If necessary, change the InTrust server that will run the report in the **Server** drop-down list. Report generation is resource-intensive, and this option can help distribute the server load evenly.

6. Review the resulting configuration and complete the wizard. On the final step, you can select to run the report immediately after you click **OK**.

Tracking Report Progress and Running Manually

Searches that are not scheduled have magnifying glass icons in the left-pane treeview. Searches that are scheduled have the icons of their respective report types.

To view a list of the reports that are currently scheduled, select the **Scheduled Report Status** node in the navigation treeview. For each report, the last known status is shown in the details pane; it can be one of the following:

- Scheduled
  The report has never been run.
- Running

- Succeeded
- Failed

You can run any idle report in this list by right-clicking the report and selecting **Run**. To stop a running report, right-click it in the list and select **Stop**.

> **NOTE:** An InTrust server can run no more than two reports at once. If more reports have overlapping schedules, they are queued.

Just like elsewhere in Repository Viewer, you can group the results in the details pane by dragging table column names to the grouping area.

Reconfiguring and Disabling Reports

Each custom search has individual reporting settings. If you want to make changes to your reports, consider the following:

- To change the result-related options, such as the report layout or filter settings, modify the search itself. This will affect all subsequent scheduled runs.
- To change the schedule, select the search you want and click **Report | Schedule Report** in the results pane. This will affect the schedule of that particular search.

To disable a schedule, select the search you want and click **Report | Remove Schedule** in the results pane. If you do this while a report is being generated, it will be completed, and the subsequent runs will be canceled.

Integration into SIEM Solutions Through Syslog Forwarding

Events that arrive in a repository can be passed on to SIEM systems that know how to receive, store and index them for analysis. This is known as audit data forwarding and is configured on a per-repository basis.

- Turning Forwarding On and Off
- Data Conversion Formats
- Basic Event Forwarding Scenario
- Advanced Event Forwarding Scenario
- Example: Set Up Forwarding to SecureWorks
- Example: Set Up Forwarding to Splunk

Turning Forwarding On and Off

Forwarding has a dedicated group of settings in the properties of a repository. Use the **Enable forwarding** option to turn it on and off for the repository you are working with.

For details about repository options, see Managing Repositories.

> ! CAUTION: **Do not forward events to an InTrust server that listens for Syslog messages, because the messages will arrive with incorrect timestamps.**

The following options control how forwarding is performed:

- **Destination host**
  The host that listens for forwarded messages.
- **Port**
  The port that the destination host uses for listening.
- **Message encoding**
  By default, Western European is used.
- **Message filtering**
  If you need only a subset of the repository data, you can specify one of the available filters. These filters are really Repository Viewer search folders. If you want to add or modify a filter, open Repository Viewer and make your changes. Your filter will be available the next time you configure forwarding. For details about working with search folders, see Searching for Events in Repository Viewer. Using search folders as filters has some important implications; see Filtering Specifics below for details.
- **Message format**
  The format in which data is expected on the receiving end; see Data Conversion Formats for details. This

setting has no effect on data that arrives from Syslog devices; such data is forwarded unchanged. Only collected Windows event log data is converted to the specified format.

Filtering Specifics

- Repository Viewer search folders support grouping and sorting, but these settings have no meaning for message forwarding and will be ignored.
- If you edit a search folder that is already used as a filter, your changes will affect the filtering. Consider making dedicated search folders for filtering purposes.
- If a filtering search folder is deleted, filtering is turned off for the repository that used it.
- If you use predefined search folders as a filters, note that changes made to them in Repository Viewer are not applied.
- Be careful when specifying the time range for the search folders that will be used as filters. If you set the wrong type of range, this can effectively turn off message forwarding. For example, if you set a time range based on the “Last” keyword, no matches will ever occur. You should not specify a time range for a filtering search folder.

Data Conversion Formats

SIEM appliances expect data in a specific format. For forwarding to be useful, InTrust must convert the contents of the repository to that format before passing them on.

The following output formats are supported:

- Dell SecureWorks
  For details, see Example: Set Up Forwarding to SecureWorks.
- IBM QRadar
- Tibco LogLogic
- Splunk (JSON)
  For details, see Example: Set Up Forwarding to Splunk.

You can add support for other formats by providing custom format definition scripts.

To specify a different format, select the **Custom Format** item in the **Message format** drop-down list, click **Edit**, and use the editor that opens.

Note the following specifics:

1. Your custom formatting code must implement the **Transform()** function. This function will be used as the entry point by the event forwarding engine. It takes an event object and its sequential number as arguments, and it returns a string.
2. The custom message format will be applied only to the repository you are working with, and will not be replicated to other repositories.
3. Switching from the custom format to the predefined format resets the custom format script to its default state. Back up your custom format script in a file.

For more details about formatting custom messages, study the default formatting script provided in the built-in editor. This is a valid script that replicates the functionality of the predefined SecureWorks forwarding component in InTrust. To change the message format, either edit the **Format** variable or write your own custom script using this default script as an example. In the **Format** string, event field names enclosed in percent signs (**%**) will be replaced by their values.

For details about event objects and the InTrust object model in general, see Customization Kit.

Basic Event Forwarding Scenario

This scenario applies if both of the following are true for the repository that you want to forward events from:

1. The InTrust server that manages the repository has at least 8 CPU cores.
2. The rate of incoming events is no more than 2,000 per second.

> **NOTE:** If you use custom script-based format conversion, the rate of outgoing events will be considerably lower than with the predefined format.

In this case, all you need to do is enable event forwarding for your existing repository, as described in the Turning Forwarding On and Off topic.

InTrust logs its event forwarding activities and gives you errors if the forwarding queue overflows. If this happens, the event rate is too high, and there will be gaps in the continuity of forwarded events. In that case, you should use the recommendations from the Advanced Event Forwarding Scenario topic.

> **NOTE:** The retention threshold for the event forwarding queue is 48 hours by default. Events that are older than the threshold value are dropped from the queue and cannot be forwarded.

Advanced Event Forwarding Scenario

In this scenario, you use a dedicated repository for event forwarding. Create a new collection specifically for the events you want to forward, and select to create a new repository for this collection.

As a final step, you can make sure that disk space is not wasted on the repository contents that you are not going to use. Set up automatic cleanup of the repository contents. For that, use the InTrust Manager console from an extended InTrust deployment to do the following:

1. Connect InTrust Manager to the organization where your repository resides.
2. Create a task and schedule it to run periodically; for example, every day.
3. Within the task, create a single repository cleanup job that clears everything from the repository used for the forwarding.
4. Commit your configuration changes.

For details about performing these steps, see the Auditing Guide.

Example: Set Up Forwarding to SecureWorks

Suppose SecureWorks is already in place in your environment and is used for tracking the operation of Syslog-enabled systems. For Windows network auditing, you use InTrust and Change Auditor. You would like to extend the scope of your SecureWorks coverage to include suspicious user activity in the Windows network.

Make Sure You Have the Data

To capture suspicious administrative activity, you would need to look at the following:

- User session events provided by InTrust
  These events provide a deep insight into user logons, logoffs and sessions.
- Change Auditor for Active Directory log
  This log provides fine-grained information about all changes to Active Directory.

Confirm that these data sources are used by the collections that work with your repository.

Configure the Forwarding

You need to enable forwarding for the repository with the necessary data. Go to the properties of the repository and, on the **Forwarding** tab, select **Enable forwarding** and specify where the messages should go.

After you have completed the collection setup, confirm that the forwarding is really working. Wait a few minutes for the new settings to take effect. After that, log on to some of the computers that InTrust is watching, and try to make Active Directory changes. Then check on the SecureWorks appliance whether it has registered your activity.

Example: Set Up Forwarding to Splunk

Suppose Splunk is deployed in your environment for analyzing Windows security events. You would like to use InTrust as the forwarding mechanism. The data you need goes to a repository that is set aside specifically for forwarding purposes. The repository has only Windows Security log data.

Get Splunk Ready

> ! CAUTION: **For the sake of speed, the Splunk forwarding component of InTrust uses the UDP protocol, so successful delivery of forwarded data is not guaranteed.**

You need to perform two procedures in Splunk (and maybe restart it), as described below.

Step 1: Define a Source Type

To make sure that event fields are recognized correctly, make a specialized source type for incoming InTrust data. If you want to use the Splunk UI for this, configure the options as follows (the last three options are set up in the **Advanced** group):

Option	Value
Category	Structured
Indexed extractions	json
NO_BINARY_CHECK	true

Option	Value
SHOULD_LINEMERGE	false
pulldown_type	1

If you want to skip configuration through the Splunk UI, include the following snippet in the ***<Splunk_installation_folder>*****\etc\apps\search\local\props.conf** file:

```
[InTrust]
DATETIME_CONFIG =
INDEXED_EXTRACTIONS = json
NO_BINARY_CHECK = true
SHOULD_LINEMERGE = false
category = Structured
pulldown_type = 1
```

Step 2: Configure a Network Input

In Splunk, add a new UDP network input and apply your new source type to it. Configure the network input as necessary, but make sure you set up the following:

1. It must use the UDP protocol.
2. Specify the source type you defined earlier; in this example, it is **InTrust**.

Make a note of the port number where Splunk will listen for forwarded UDP traffic. You are going to need it for InTrust forwarding configuration.

If you want to skip configuration through the Splunk UI, include the following snippet in the ***<Splunk_installation_folder>*****\etc\apps\search\local\inputs.conf** file:

```
[udp://514]
connection_host = ip
index = main
sourcetype = InTrust
```

For details about the various ways that you can add network inputs in Splunk, see the "Get data from TCP and UDP ports" article in the documentation of your version of Splunk.

Step 3 (Conditional): Restart Splunk

If you made your changes by editing configuration files, restart Splunk to apply them; use either the **splunk stop** and **splunk start** commands or the **Restart** action in the Splunk UI. For details, see the Splunk documentation.

Configure the Forwarding

To send data to Splunk, enable forwarding for the repository with the necessary data. Go to the properties of the repository and, on the **Forwarding** tab, select **Enable forwarding** and specify where the data should go.

Select **Splunk (JSON)** as the message format, and specify the correct Splunk host name and the UDP port where the forwarded data is expected.

After you have completed the collection setup, confirm that the forwarding is really working. Wait a few minutes for the new settings to take effect. After that, log on to some of the computers that InTrust is watching, and try to make Active Directory changes. Then open Splunk and check whether your activity has registered.

Further Reading

This guide dealt with the default InTrust configuration. If you are interested in other InTrust capabilities and alternative workflows, or if you need in-depth information about the topics covered here, go to the InTrust online documentation library.

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