

## **Automated Support Infrastructure (ASI) Support Query Module User Guide**

The ASI support query module (SQM) performs automated support knowledge base searches using the information reported in the event logs produced by the ASI Client. Version 1.0 of the SQM generates these searches for event logs generated by Scrip 38, which detects and reports faults, Scrip 77 which detects and reports changes in the MS Windows event log, and Scrip 94, which detects and reports dialog boxes.

The knowledge bases accessed by SQM include:

- Microsoft support knowledge base
- Microsoft TechNet knowledge base
- Microsoft Developer Network knowledge base

In addition, SQM also performs searches of:

- World Wide Web
- Usenet groups

SQM performs searches of two types:

- All Words – using all of the words in a message, or a portion of a message, and selected keywords (e.g. fault) as the matching requirement for the search
- Exact Phrase – using an entire message, or a portion of a message, as the exact phrase matching requirement for the search

At this point, all searches performed cover all products. In other words, even when an event is generated by a specific application, the search for potential resolution(s) of the symptom is not restricted to the specific application but covers all products.

Given the inexact and “porous” nature of the information typically contained in knowledge bases, we believe that searching for potential symptom resolution(s) across all products, to start with, probably makes more sense.

At the same time, we recognize the value of having the capability to conduct product-specific searches and, do not rule out future implementation of product-specific knowledge base searches.

In general, searches performed by SQM can be grouped into two classes:

- Fault searches – looking for potential resolution(s) of faults occurring on a user’s system

- Dialog box searches – using the content of messages generated by applications, utilities, and system software to look for potential resolution(s) of non-fault symptoms occurring on a user's system

## Fault Searches

When the HandsFree Networks client detects a fault on a user's system (client or server), and its solution is not in the automated solutions database, it produces a report that contains detailed information about the fault.

When conducting a search of the Microsoft support knowledge base to identify potential solutions/work arounds for a fault, the key elements are:

- Name and version of faulting process
- Name and version of faulting module
- Name and version of the operating system
- Type of fault

The most frequently occurring faults are, by far, access violations, i.e. invalid page faults (IPF), illegal page faults (ILPF), and general protection faults (GPF). Of these, invalid page faults are the ones that occur most frequently.

Typically, when an IPF, ILPF, or GPF occurs, the system generates one of two types of messages:

- "<name of faulting process without extension> caused a(n) /IPF/ILPF/GPF in <name of faulting process including extension>"
- "<name of faulting process without extension> caused a(n) /IPF/ILPF/GPF in module <name of faulting process including extension>"

Before we describe the searches of the Microsoft support knowledge base that SQM performs to identify potential solutions/work arounds for a fault, we should note that the memory location of a fault is rarely a good parameter for identifying the solution of a fault. The main reasons for this are:

- Differences in process/module size among builds of the same version of a process/module
- Differences in users' system configurations
- Differences in system environments at the time the fault occurred, i.e. which versions of which applications were running, and in which order, at the time the fault occurred
- Certain processes may always run at the same memory location. When a fault occurs involving them memory location does not provide information useful for identifying potential solutions for the fault

There are three basic searches that should be conducted in order to identify potential solutions/work arounds for a fault. They are, in order from most narrow (likely to produce

fewer, more direct hits, if successful), to broadest (likely to produce more hits the majority of which are not likely to be relevant for the solution of the fault):

- 1)** Searches for which the value of the search parameter is one of the following phrases:
  - a)** "<faulting process name without extension> caused an invalid page fault in <faulting module name with extension>"
  - b)** "<faulting process name without extension> caused an invalid page fault in module <faulting module name with extension>"
- 2)** Searches for which the value of the search parameter is a portion of one of the phrases above:
  - a)** "<faulting process name without extension> caused"
  - b)** "<faulting process name without extension> caused an invalid"

If necessary, the above searches should be conducted for ILPFs, GPFs and stack faults.

- 3)** Searches for which the value of the search parameter is one of the following Microsoft support knowledge base keyword combinations:
  - a)** Fault, crash, ipf, or gpf
  - b)** <faulting process name without extension> module ipf  
     <faulting module name with extension> module ipf
  - c)** <faulting process name without extension> module gpf  
     <faulting module name with extension> module gpf
  - d)** <faulting process name without extension> module crash  
     <faulting module name with extension> module crash
  - e)** <faulting process name without extension> module fault  
     <faulting module name with extension> module fault
  - f)** <faulting process name without extension> ipf  
     <faulting module name with extension> ipf
  - g)** <faulting process name without extension> gpf  
     <faulting module name with extension> gpf
  - h)** <faulting process name without extension> crash  
     <faulting module name with extension> crash

- i) <faulting module name without extension> fault

<faulting module name with extension> fault

Generally speaking, Exact Phrase searches, where the search engine looks for occurrences of a phrase, are the most narrow and likely to produce fewer more direct hits (if successful). "All Words" searches are broader, likely to return more, less relevant, records (knowledge base articles).

## Dialog Box Text Searches

When a dialog box is generated on a user's system (client or server), the ASI client detects it and logs its content. The text portion of a dialog box is of particular interest for problem resolution.

In many cases, using this text one can run a search of vendor knowledge bases to identify potential solutions for the problem that occurred on the user's system and that generated the dialog box text.

Generally speaking, dialog box text has three distinct portions:

- 1) Window title, which in a significant number of cases may give the name of the executable that generated the message, e.g. "Window title: Microsoft Internet Explorer"
- 2) One to three initial sentences (only in rare cases more than three) describing the event and proposed actions, e.g.
  - a) "There was an internal error and one of the windows you were using will be closed. It is recommended that you save your work, close all programs, and then restart your computer."
  - b) "There was an error reading your Internet e-mail service. Click the Tools menu, click Services, delete the service and then create a new one."
  - c) "The drive or network connection that the shortcut 'Microsoft Office.Ink' refers to is unavailable. Make sure that the disk is properly inserted or the network resource is available, and then try again."
- 3) Information that is specific to the event that just occurred, e.g.
  - a) "\\Mray\Projects is not accessible." Where "\\Mray\Projects" is the name of a shared resource on a user's network
- 4) Additional sentences that may provide more information about the event, e.g.
  - a) "abnormal program termination" in the following message: "Runtime Error! Program: C:\PROGRAM FILES\MICROSOFT OFFICE\OFFICE\WINWORD.EXE abnormal program termination"
  - b) "Attempt recovery now?" in the following message: "Word encountered file corruption while opening C:\Program Files\...\STARTUP\PALMAPP.DOT. Part of this document may be recoverable. Attempt recovery now?"

When a dialog box's text contains specific information about a user's system or network (see 3) above), a SQM search using the dialog box's text does not contain this text. Only the generic part of the text is used. For example:

- Of the text "Word encountered file corruption while opening C:\Program Files\...\STARTUP\PALMAPP.DOT." SQM uses only "Word encountered file corruption while opening".
- Of the text "Runtime Error! Program: C:\PROGRAM FILES\MICROSOFT OFFICE\OFFICE\WINWORD.EXE abnormal program termination", SQM uses only "Runtime Error! Program:" and "abnormal program termination".

When a search using a complete sentence, does not return any records, SQM performs searches using fragments of the sentence. For example, a search of the Microsoft support knowledge base for potential resolutions of the symptom reported with the message **"Unable to start print job due to insufficient memory or invalid printer specification."**, returns zero records.

Searches using sentence fragments **"Unable to start print job due to insufficient memory"**, and **"invalid printer specification."** return respectively four and ten records.

### Additional Search Resources

After completing searches of the vendor knowledge bases, SQM constructs searches of the Internet for information on the problem detected by the ASI Client. These searches cover both the World Wide Web and Usenet groups. Experience to date has shown that the following search engines produce the best results:

- <http://www.google.com/>
- <http://hotbot.lycos.com/>
- <http://www.lycos.com/>
- <http://www.directhit.com/>

The initial version of SQM uses the Google™ search engine to prepare searches of both the World Wide Web and Usenet groups. The searches that are prepared are the same as those performed on the vendor knowledge bases.

### SQM User Interface

The [Event Detail](#) page for each symptom detected by the ASI client has a link to the SQM [Search Knowledge Base](#) page for that event, contained in the following sentence:

You may also view results of [knowledge base](#) searches about the symptom reported by this event.

By clicking on [knowledge base](#) you go directly to the page containing the results of searches for potential resolutions to the symptom reported.

The [Search Knowledge Base](#) pages for faults and non-fault symptoms that generate dialog boxes are slightly different. The two sections that follow describe the contents for these two kinds of [Search Knowledge Base](#) pages.

Clicking on the [help](#) link on the top right-hand corner of the [Search Knowledge Base](#) page, will take you to the [Help Index](#) page where you can access this SQM user guide online and you can download it.

## Fault Searches

The [Search Knowledge Base](#) page for faults has two main parts.

The first part, shown below, reports the knowledge base searches that returned one or more records in ascending order, with the search returning the fewest number of records listed first. All these search results are based on execution of the [Default Search](#) search (see below for definition) using all the strings listed in the second part of the [Search Knowledge Base](#) page.

events: [ad-hoc query](#) | [filters](#) | [notifications](#) | [console](#) | [reports](#)  
 assets: [queries](#) | [console](#) | [changes](#) | [reports](#)  
 sites: [configuration](#) | [updates](#)  
 provisioning: [products](#) | [sites](#) | [metering](#) | [audit](#)  
 information portal: [event](#) | [asset](#) | [change](#) | [meter](#)  
 tools: [admin](#) | [census](#) | [help](#)

### Search Knowledge Base

Click 'back' on your browser to return to the query results or perform a [new query](#).  
 You can also [view a description of scrip 38](#) which provides more information about the fields on this page.

**Servertime:** 2001-06-15 15:44:18  
**Username:** dmclead  
**Executable:** mshtml.dll  
**Window title:**  
**Machine:** pike  
**Process:** C:\Program Files\Internet Explorer\IEXPLORE.EXE

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**IEXPLORE caused an Invalid Page Fault in MSHTML.DLL**  
 The search for this exact phrase found [one result](#).

**IEXPLORE caused an Invalid Page Fault in module MSHTML.DLL**  
 The search for this exact phrase found [7 results](#).

**IEXPLORE caused fault MSHTML.DLL**  
 The search for all the words found [25 results](#).

**MSHTML.DLL fault**  
 The search for all the words found [27 results](#).

**IEXPLORE caused an Invalid Page Fault**  
 The search for this exact phrase found [44 results](#).

**IEXPLORE caused**  
 The search for this exact phrase found [54 results](#).

[DLL Help](#)

This part also contains a link to the Microsoft DLL help database. Clicking on this link will take you to the Microsoft DLL help database with the name of the faulting module already entered in the File Name: box.

The second part of the [Search Knowledge Base](#) page for faults, shown below, lists all the strings The SQM used in its searches. For each string, there is a link to a ready-to-go search. Four types of such searches are listed for each string:

- [Default Search](#) – This search uses the main Microsoft search engine covering all the Microsoft knowledge bases. All the search results reported by SQM are based on execution of this search using all the listed strings.
- [Support Search](#) – This search uses the Microsoft support knowledge base. Even though the support knowledge base is included in the [Default Search](#), in practice there are some differences. Support knowledge base searches return up to 200 records instead of a maximum of 100 returned by the [Default Search](#). In addition, we have seen cases in which the support search returns a higher number of support knowledge base records than the [Default Search](#).
- [Google Search](#) – This is a search of the World Wide Web using the Google™ search engine.
- [Usenet Search](#) – This is a search of Usenet groups using the Google™ search engine.

1. **IEXPLORE caused**
  1. [Default Search](#)
  2. [Support Search](#)
  3. [Google Search](#)
  4. [Usenet Search](#)
2. **IEXPLORE caused an Invalid Page Fault**
  1. [Default Search](#)
  2. [Support Search](#)
  3. [Google Search](#)
  4. [Usenet Search](#)
3. **IEXPLORE caused an Invalid Page Fault in module MSHTML.DLL**
  1. [Default Search](#)
  2. [Support Search](#)
  3. [Google Search](#)
  4. [Usenet Search](#)
4. **IEXPLORE caused an Invalid Page Fault in MSHTML.DLL**
  1. [Default Search](#)
  2. [Support Search](#)
  3. [Google Search](#)
  4. [Usenet Search](#)
5. **IEXPLORE caused a General Protection Fault in MSHTML.DLL**
  1. [Default Search](#)
  2. [Support Search](#)
  3. [Google Search](#)
  4. [Usenet Search](#)
6. **IEXPLORE caused a General Protection Fault in module MSHTML.DLL**
  1. [Default Search](#)
  2. [Support Search](#)
  3. [Google Search](#)
  4. [Usenet Search](#)
7. **IEXPLORE caused fault MSHTML.DLL**
  1. [Default Search](#)
  2. [Support Search](#)
  3. [Google Search](#)
  4. [Usenet Search](#)
8. **MSHTML.DLL fault**
  1. [Default Search](#)

## Dialog Box Text Searches

An example of the [Search Knowledge Base](#) page for non-fault symptoms as detected with dialog boxes and other Windows events is shown below. It is very similar to the faults [Search Knowledge Base](#) page.

In addition to the searches performed, the main difference is the lack of a link to the DLL Help Database. In general, the number of searches performed by the SQM for potential resolutions of non-fault symptoms at this point is lower.

events: [ad-hoc query](#) | [filters](#) | [notifications](#) | [console](#) | [reports](#)  
 assets: [queries](#) | [console](#) | [changes](#) | [reports](#)  
 sites: [configuration](#) | [updates](#)  
 provisioning: [products](#) | [sites](#) | [metering](#) | [audit](#)  
 information portal: [event](#) | [asset](#) | [change](#) | [meter](#)  
 tools: [admin](#) | [census](#) | [help](#)

### Search Knowledge Base

Click 'back' on your browser to return to the query results or perform a [new query](#).  
 You can also [view a description of scrip 47](#) which provides more information about the fields on this page.

**Servertime:** 2001-06-01 16:12:54  
**Username:** Scott Noone  
**Executable:**  
**Window title:** Microsoft Visual C++  
**Machine:** node2

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**Failed to create empty document.**  
 The search for this exact phrase found [4 results](#).

**Failed to create empty document.**  
 The search for all the words found [35 results](#).

- 
1. **Failed to create empty document.**
    1. [Default Search](#)
    2. [Support Search](#)
    3. [Google Search](#)
    4. [Usenet Search](#)
- 

## Microsoft Knowledge Base Keyword-based Searches

The SQM is an evolving tool. The first version laid a solid foundation. Over time, we will add functionality aiming particularly at identifying and performing searches that return a (small) number of highly relevant records pointing to the actual solution of a symptom.

One area where we have already conducted extensive experiments is in the use of knowledge base keywords when performing searches of Microsoft knowledge bases, particularly the support knowledge base.

Using knowledge base keywords in conjunction with the name of modules (e.g. faulting process and faulting module) or message strings typically produces searches that yield fewer results of higher quality.

In addition, searches using keywords can help locate information on symptoms related to a specific product even when that information is classified under a different product.



While we work on incorporating keyword searches in the SQM, for your convenience below you will find links to various resources that list keywords used by Microsoft to classify information in its knowledge bases.

## **General**

How to Query the Microsoft Knowledge Base Using Keywords

<http://support.microsoft.com/support/kb/articles/Q242/4/50.ASP?LN=EN-US&SD=gn&FR=0>

How to Search for Desktop Systems Articles by KBSubcategory

<http://support.microsoft.com/support/kb/articles/Q96/1/32.ASP?LN=EN-US&SD=gn&FR=0>

Tips for Finding Knowledge Base Articles on the TechNet CD

<http://support.microsoft.com/support/kb/articles/Q123/8/02.asp>

## **Microsoft Access**

<http://support.microsoft.com/support/kb/articles/Q119/5/26.asp>

## **Microsoft Exchange**

<http://support.microsoft.com/support/kb/articles/Q140/9/50.asp?LN=EN-US>

## **Microsoft Powerpoint**

<http://support.microsoft.com/support/kb/articles/Q44/1/28.ASP?LN=EN-US>

## **Windows NT**

<http://support.microsoft.com/support/kb/articles/Q102/6/52.asp?LN=EN-US&SD=gn&FR=0>

## **Windows 2000**

<http://support.microsoft.com/support/kb/articles/Q250/5/81.ASP>

## **Microsoft Development Tools**

<http://search.support.microsoft.com/kb/psssearch.asp?SPR=msall&T=B&KT=PHRASE&T1=7d&LQ=kbkeywordlist&PQ=PastQuery&S=F&A=T&DU=C&FR=0&D=support&LPR=&LNG=ENG&VR=http%3A%2F%2Fsupport.microsoft.com%2Fsupport%3Bhttp%3A%2F%2Fsupport.microsoft.com%2Fservicedesks%2Fwebcasts%3Bhttp%3A%2F%2Fsupport.microsoft.com%2Fhighlights&CAT=Support&VRL=ENG&SA=GN>