Sun StorageTek 5800 System SDK Developer's Guide
## Contents

Preface ..................................................................................................................................................... 7  

1 Introduction to the Sun StorageTek 5800 System Client SDK ...................................................... 11  
   Overview of the SDK ........................................................................................................................ 11  
   SDK Terms of Use ............................................................................................................................ 12  
   SDK Components ............................................................................................................................ 12  
   Supported Operating Systems ....................................................................................................... 12  
   Software Requirements .................................................................................................................. 13  
   SDK Installation Instructions ......................................................................................................... 13  
   5800 System Semantics Overview ................................................................................................. 13  
      Data and Metadata ...................................................................................................................... 13  
      Metadata Schema ...................................................................................................................... 14  
      Attributes ................................................................................................................................. 14  
      Namespace ............................................................................................................................... 14  
   5800 System Query Language ....................................................................................................... 14  
   SDK Application Deployment ....................................................................................................... 15  
      Java API ................................................................................................................................. 15  
      C API ..................................................................................................................................... 15  

2 Example Applications ..................................................................................................................... 17  
   Example Application Summary .................................................................................................... 17  
   Java Example Applications ........................................................................................................... 18  
      Examples Overview .................................................................................................................. 19  
      Software Requirements ........................................................................................................... 19  
      Running the Applications ....................................................................................................... 19  
      Building the Java Example Applications ............................................................................... 19  
      Running a Java Example Application ..................................................................................... 19
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>About the Example Application Source Code</td>
<td>20</td>
</tr>
<tr>
<td>Example Applications</td>
<td>20</td>
</tr>
<tr>
<td>StoreFile</td>
<td>20</td>
</tr>
<tr>
<td>CheckIndexed</td>
<td>21</td>
</tr>
<tr>
<td>RetrieveData</td>
<td>22</td>
</tr>
<tr>
<td>RetrieveMetadata</td>
<td>23</td>
</tr>
<tr>
<td>AddMetadata</td>
<td>23</td>
</tr>
<tr>
<td>DeleteRecord</td>
<td>25</td>
</tr>
<tr>
<td>Query</td>
<td>25</td>
</tr>
<tr>
<td>RetrieveSchema</td>
<td>27</td>
</tr>
<tr>
<td>GetDate</td>
<td>27</td>
</tr>
<tr>
<td>C Example Applications</td>
<td>28</td>
</tr>
<tr>
<td>Example Overview</td>
<td>28</td>
</tr>
<tr>
<td>Software Requirements</td>
<td>28</td>
</tr>
<tr>
<td>Building the C Example Applications</td>
<td>29</td>
</tr>
<tr>
<td>Running a C Example Application</td>
<td>29</td>
</tr>
<tr>
<td>About the C Example Application Source Code</td>
<td>29</td>
</tr>
<tr>
<td>Example Applications</td>
<td>30</td>
</tr>
<tr>
<td>StoreFile</td>
<td>30</td>
</tr>
<tr>
<td>CheckIndexed</td>
<td>31</td>
</tr>
<tr>
<td>RetrieveData</td>
<td>32</td>
</tr>
<tr>
<td>RetrieveMetadata</td>
<td>32</td>
</tr>
<tr>
<td>AddMetadata</td>
<td>33</td>
</tr>
<tr>
<td>DeleteRecord</td>
<td>34</td>
</tr>
<tr>
<td>Query</td>
<td>35</td>
</tr>
<tr>
<td>RetrieveSchema</td>
<td>36</td>
</tr>
<tr>
<td>3  Sun StorageTek 5800 System Emulator</td>
<td>39</td>
</tr>
<tr>
<td>Introduction to the Emulator</td>
<td>39</td>
</tr>
<tr>
<td>Software Requirements</td>
<td>39</td>
</tr>
<tr>
<td>Emulator Startup</td>
<td>40</td>
</tr>
<tr>
<td>Emulator Shutdown</td>
<td>40</td>
</tr>
<tr>
<td>Schema Modification</td>
<td>40</td>
</tr>
<tr>
<td>▼ To Manually Clear the Emulator Contents</td>
<td>40</td>
</tr>
<tr>
<td>Emulator Event Log</td>
<td>41</td>
</tr>
</tbody>
</table>
Preface

The *Sun StorageTek 5800 System SDK Developer’s Guide* is written for programmers and application developers. This document, along with the *Sun StorageTek 5800 System Client API Reference Guide*, provides the information that you need in order to develop custom applications for the Sun StorageTek 5800 System.

**How This Book Is Organized**

- **Chapter 1, “Introduction to the Sun StorageTek 5800 System Client SDK,”** provides an introduction to the Sun StorageTek 5800 System client Software Development Kit (SDK) and its components.
- **Chapter 2, “Example Applications,”** provides information about the Java and C example applications that are provided with the Sun StorageTek 5800 SystemSDK.
- **Chapter 3, “Sun StorageTek 5800 System Emulator,”** provides information on running the Sun StorageTek 5800 System emulator.

**Related Books**

- *Sun StorageTek 5800 System Site Preparation Guide*, part number 820–1635
- *Sun StorageTek 5800 System Administration Guide*, part number 819–7555
- *Sun StorageTek 5800 System Client API Reference Guide*, part number 819–7557
- *Sun StorageTek 5800 System Release Notes*, part number 819–7559
Related Third-Party Web Site References

Third-party URLs are referenced in this document and provide additional, related information.

**Note** – Sun is not responsible for the availability of third-party web sites mentioned in this document. Sun does not endorse and is not responsible or liable for any content, advertising, products, or other materials that are available on or through such sites or resources. Sun will not be responsible or liable for any actual or alleged damage or loss caused or alleged to be caused by or in connection with use of or reliance on any such content, goods, or services that are available on or through such sites or resources.

Documentation, Support, and Training

The Sun web site provides information about the following additional resources:


Typographic Conventions

The following table describes the typographic conventions that are used in this book.

<table>
<thead>
<tr>
<th>Typeface</th>
<th>Meaning</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>AaBbCc123</td>
<td>The names of commands, files, and directories, and onscreen computer output</td>
<td>Edit your .login file. Use ls -a to list all files. machine_name% you have mail.</td>
</tr>
<tr>
<td>AaBbCc123</td>
<td>What you type, contrasted with onscreen computer output</td>
<td>machine_name% su</td>
</tr>
<tr>
<td>aabbcc123</td>
<td>Placeholder: replace with a real name or value</td>
<td>The command to remove a file is rm filename.</td>
</tr>
</tbody>
</table>
### TABLE P–1  Typographic Conventions  
*(Continued)*  

<table>
<thead>
<tr>
<th>Typeface</th>
<th>Meaning</th>
<th>Example</th>
</tr>
</thead>
</table>
| **AaBbCc123**     | Book titles, new terms, and terms to be emphasized | Read Chapter 6 in the *User's Guide*.  
A cache is a copy that is stored locally.  
Do not save the file.  
**Note:** Some emphasized items appear bold online. |

### Shell Prompts in Command Examples

The following table shows the default UNIX® system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

### TABLE P–2  Shell Prompts

<table>
<thead>
<tr>
<th>Shell</th>
<th>Prompt</th>
</tr>
</thead>
<tbody>
<tr>
<td>C shell</td>
<td><code>machine_name%</code></td>
</tr>
<tr>
<td>C shell for superuser</td>
<td><code>machine_name#</code></td>
</tr>
<tr>
<td>Bourne shell and Korn shell</td>
<td><code>$</code></td>
</tr>
<tr>
<td>Bourne shell and Korn shell for superuser</td>
<td><code>#</code></td>
</tr>
</tbody>
</table>

### Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can submit your comments by going to:


Please include the title and part number of your document with your feedback:

*Sun StorageTek 5800 System SDK Developer's Guide*, part number 819-7558
This chapter provides an introduction to the Sun StorageTek 5800 System client Software Development Kit (SDK) and its components.

The following topics are discussed:

- “Overview of the SDK” on page 11
- “SDK Terms of Use” on page 12
- “SDK Components” on page 12
- “Supported Operating Systems” on page 12
- “Software Requirements” on page 13
- “SDK Installation Instructions” on page 13
- “5800 System Semantics Overview” on page 13
- “5800 System Query Language” on page 14
- “SDK Application Deployment” on page 15

Overview of the SDK

The 5800 system client SDK enables you to work with data and metadata stored on a 5800 system. A 5800 system system emulator is included for the developer’s convenience.

This document assumes that you have a basic understanding of how the 5800 system uses data and metadata. For more information, see “5800 System Semantics Overview” on page 13.

The SDK comes with an emulator that enables you to test client applications without having to connect to a 5800 system. For further documentation on the emulator, see Chapter 3, “Sun StorageTek 5800 System Emulator.” Also refer to the Sun StorageTek 5800 System Administration Guide to better understand the type of server being emulated.

The SDK provides separate Application Programming Interfaces (APIs) for the Java™ and C languages. These APIs enable you to store and retrieve data and to store, retrieve, query, and delete metadata records.
For more information on the Java and C APIs, refer to the Sun StorageTek 5800 System Client API Reference Guide. Also, see Chapter 2, “Example Applications.” For known bugs, see the Sun StorageTek 5800 System Release Notes.

SDK Terms of Use

The 5800 system client SDK is released to you under the following copyright notice:

“Copyright 2007 Sun Microsystems, Inc. All rights reserved. Use is subject to license terms.”

License terms are contained in the file StorageTek_5800_SLA&Entitlement&PRN.txt in the top-level directory of the installation. Licence terms for embedded software are in the file LICENSE.txt in the same directory.

SDK Components

The 5800 system client SDK distribution includes a Java distribution (Java examples and Java libraries), a C distribution (C examples and libraries), and the 5800 system emulator. All parts of the SDK support Solaris, Linux, and Windows environments.

The Java and C example programs serve both as examples of how to program a client application and as generally useful utilities in their own right.

The contents of the .zip archive include:
  ■ SDK_Overview_README.html
  ■ doc/
  ■ java/
  ■ c/
  ■ emulator/
  ■ StorageTek_5800_SLA&Entitlement&PRN.txt
  ■ LICENSE.txt

Supported Operating Systems

This release supports the following operating systems:
  ■ Red Hat Enterprise Linux 4 (32 bit)
  ■ Red Hat Enterprise Linux 4 (64 bit)
  ■ Solaris 9 SPARC
  ■ Solaris 10 SPARC
  ■ Solaris 10 x64 and x86
Software Requirements

In order to use the 5800 system C API, the following software is required:

- All platforms
  - GNU make
  - Perl
- Solaris: Sun Studio
- Linux: gcc
- Windows 2003 server:
  - Microsoft Visual C++ Express Edition 2005
  - Microsoft Windows SDK
  - Cygwin (See http://www.cygwin.com)

SDK Installation Instructions

The 5800 system SDK is compressed in a file with a name similar to StorageTek5800_SDK_1_1-20.zip, where 1_1-20 refers to the version (1_1) and build number (20). This .zip file expands into a directory StorageTek5800_SDK_1_1-20, which contains the entire SDK.

5800 System Semantics Overview

This section provides an overview of 5800 system semantics.

Data and Metadata

The 5800 system stores two types of data: arbitrary object data and structured metadata records. Every metadata record is associated with exactly one data object. Every data object has at least one metadata record. A unique object identifier (OID) is returned when a metadata record is stored. The OID can later be used to retrieve the metadata record or its object data. In addition, metadata records can be retrieved by a query:

OID ↔ Metadata Record → Object Data

The two types of metadata are system metadata and user metadata. The names and types of system metadata are predefined and cannot be overridden by the user.
Metadata Schema

A user metadata record consists of a set of attributes. The set of possible attributes is defined by the schema. Only one schema exists for each 5800 system. For information on configuring a schema, see “Configuring Metadata and File System Views” in Sun StorageTek 5800 System Administration Guide.

The 5800 system emulator loads its schema from an XML file. The metadata_merge_config utility can be used to extend the default schema, appending the new entries to the original schema, which is then read by the emulator. For additional information, see Chapter 2, “Example Applications,” and Chapter 3, “Sun StorageTek 5800 System Emulator.”

Attributes

For information on the valid data types that you can use when specifying attributes in a schema, see “Configuring Metadata and File System Views” in Sun StorageTek 5800 System Administration Guide.

Namespace

A namespace is a container that holds a set of typed attribute names. Attribute names must be unique within a given namespace. Defining a namespace is a way to organize and group together a set of related attribute names for a given application. For more information, see “Configuring Metadata and File System Views” in Sun StorageTek 5800 System Administration Guide.

5800 System Query Language

The 5800 system Java and C APIs both have a Query method that passes a query string to the 5800 system. Queries are presented to the name-value metadata cache.

For more information on the 5800 system query language, see Chapter 4, “Sun StorageTek 5800 System Query Language,” in Sun StorageTek 5800 System Client API Reference Guide.
SDK Application Deployment

Java API
You must deploy honeycomb-client.jar with any application using the Java API. If you are using the SDK example applications, you must also deploy honeycomb-sdk.jar.

C API
The files in the lib directory must be deployed with any application using the C API. Different lib directories exist for different operating systems. You must use the correct lib directory for the OS under which the application is deployed. The LD_LIBRARY_PATH environment variable must be set accordingly for Unix systems. In the Windows environment, you must update the PATH environment variable.
This chapter provides information about the Java and C example applications that are provided with the 5800 system SDK.

The following topics are discussed:
- “Example Application Summary” on page 17
- “Java Example Applications” on page 18
- “C Example Applications” on page 28

Example Application Summary

Table 2–1 summarizes the Java and C example applications provided with the 5800 system SDK. All code examples are command-line applications.

For detailed information about the Java example applications, see “Java Example Applications” on page 18.

For detailed information about the C example applications, see “C Example Applications” on page 28.

<table>
<thead>
<tr>
<th>Application</th>
<th>Java Version</th>
<th>C Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>StoreFile</td>
<td>“StoreFile” on page 20</td>
<td>“StoreFile” on page 30</td>
</tr>
<tr>
<td>StoreFile</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 2–1  5800 system Client SDK Example Applications (Continued)

<table>
<thead>
<tr>
<th>Application</th>
<th>Java Version</th>
<th>C Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>CheckIndexed</td>
<td>&quot;CheckIndexed&quot; on page 21</td>
<td>&quot;CheckIndexed&quot; on page 31</td>
</tr>
<tr>
<td>RetrieveData</td>
<td>&quot;RetrieveData&quot; on page 22</td>
<td>&quot;RetrieveData&quot; on page 32</td>
</tr>
<tr>
<td>RetrieveMetadata</td>
<td>&quot;RetrieveMetadata&quot; on page 23</td>
<td>&quot;RetrieveMetadata&quot; on page 32</td>
</tr>
<tr>
<td>AddMetadata</td>
<td>&quot;AddMetadata&quot; on page 23</td>
<td>&quot;AddMetadata&quot; on page 33</td>
</tr>
<tr>
<td>DeleteRecord</td>
<td>&quot;DeleteRecord&quot; on page 25</td>
<td>&quot;DeleteRecord&quot; on page 34</td>
</tr>
<tr>
<td>Query</td>
<td>&quot;query&quot; on page 25</td>
<td>&quot;query&quot; on page 35</td>
</tr>
<tr>
<td>RetrieveSchema</td>
<td>&quot;RetrieveSchema&quot; on page 27</td>
<td>&quot;RetrieveSchema&quot; on page 36</td>
</tr>
<tr>
<td>GetDate</td>
<td>&quot;GetDate&quot; on page 27</td>
<td>N/A</td>
</tr>
</tbody>
</table>

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**Java Example Applications**

This section provides detailed information about the Java example applications provided with the 5800 system client SDK.
Examples Overview

Included with the 5800 system SDK are several command-line example applications that demonstrate the Java API. The example applications are located in the SDK in the java/examples directory. These example applications come complete with a build script.

Software Requirements

The Java example applications require at minimum the JDK™ 5.0 software.

Note – For Windows 2003, add C:\Program Files\Java\jdk version\bin to the PATH environment variable.

Running the Applications

UNIX (.sh) and Windows (.bat) scripts for running the example applications are provided in the java/scripts/ directory. These scripts must be run from the java/scripts/ directory. The scripts illustrate the CLASSPATH environment variable required. The .jar files are in the java/lib/ directory.

Note – The usage messages printed by the applications omit the CLASSPATH environment variable for the sake of readability. If you are running the example application without using the provided scripts, then you must set the CLASSPATH environment variable manually.

Building the Java Example Applications

To build the Java example applications, go to the java/examples/ directory and execute the master-build.sh script for Solaris and Linux environments or the master-build.bat script for Windows environments. These scripts build the examples and put them in the honeycomb-sdk.jar archive located in the java/lib directory.

Running a Java Example Application

Once you have built the Java example applications, go to the java/scripts directory and execute the .sh scripts for Solaris and Linux environments or .bat scripts for Windows environments:

Syntax: script_name arguments

See the scripts for details of how the applications are run.
About the Example Application Source Code

The Java example applications are all simple applications that follow the same basic structure. First, Commandline.parse is called to parse the argument list. Next, the appropriate method in the NameValueObjectArchive class is called to communicate with the 5800 system server. Finally, output is delivered back to either standard output, a file, or both. Refer to the comments in the sample code for further details.

Example Applications

The following sections describe the Java example applications that are included with the 5800 system client SDK:

- "StoreFile" on page 20
- "CheckIndexed" on page 21
- "RetrieveData" on page 22
- "RetrieveMetadata" on page 23
- "AddMetadata" on page 23
- "DeleteRecord" on page 25
- "Query" on page 25
- "RetrieveSchema" on page 27
- "GetDate" on page 27

StoreFile

Stores a file and associated metadata to a 5800 system server.

Synopsis

```
java StoreFile <IP | HOST> <FILE> [OPTIONS]
```

Description

Stores a file and its associated metadata record. If no -m options are specified, a metadata record without user content is generated. The OID of the metadata record is printed to stdout.

Note – StoreFile interprets the time in metadata arguments as local time zone unless the T..Z format indicating UTC is used. For example, 1952-10-27T00:30:29.999Z.

Options

```
-m <name>=<value>
```

Any number of -m options can be specified. Each -m option specifies a single (name, value) pair.
<name> should be specified in the format <namespace>.<attribute>. Use double quotes if <value> is a string containing spaces.

-h

Print this message.

Examples

```java
java StoreFile 10.152.0.12 myFile
java StoreFile server myFile.jpg \
   -m filesystem.mimetype="image/jpeg"
java StoreFile server myFile \
   -m system.test.type_char="do re mi"
java StoreFile server myFile \
   -m system.test.type_string="fa so la"
java StoreFile server myFile \
   -m system.test.type_long=123
java StoreFile server myFile \
   -m system.test.type_double=1.23
java StoreFile server myFile \
   -m system.test.type_binary=0789abcdef
java StoreFile server myFile \
   -m system.test.type_date=2010-10-20
java StoreFile server myFile \
   -m system.test.type_time=23:30:29
java StoreFile server myFile \
   -m system.test.type_timestamp="2010-10-20 23:30:29.999"
java StoreFile server myFile \
   -m name1=value1 -m name2="value 2"
```

Source Code

java/examples/StoreFile.java

CheckIndexed

Ensure an object is queryable. Checks if the metadata for an object is present in the query engine, and inserts the metadata if it is not present.

Synopsis

```
java CheckIndexed <IP | HOST> <OID> [OPTIONS]
```
**Description**
Check with the 5800 system server to determine if the specified OID has become queryable. If not, attempt to make it queryable.

A short message about the supplied OID is printed to stdout:

- Object **OID** was already queryable.
- Object **OID** not yet queryable.
- Object **OID** has now been made queryable.

**Options**
- `-h`

Print this message.

**Examples**
```java
java CheckIndexed server \ 0200004f75ee01094cc13e11dbbad000e08159832d000024d4020000000
java CheckIndexed 10.152.0.12 \ 0200004f75ee01094cc13e11dbbad000e08159832d000024d4020000000
```

**Source Code**
`java/examples/CheckIndex.java`

**RetrieveData**
Retrieves data from a 5800 system server.

**Synopsis**
```java
java RetrieveData <IP | HOST> <OID> [FILE] [OPTIONS]
```

**Description**
Retrieves data from the 5800 system. The **OID** specifies what data to retrieve. Data is written to **FILE**, if specified, otherwise to stdout.

**Options**
- `-h`

Print this message.
Examples

```java
java RetrieveData archivehost \
    0200004f75ee01094cc13e11dbbad000e08159832d000024d4020000000 \
    /archive/log.1
java RetrieveData 10.152.0.12 \
    0200004f75ee01094cc13e11dbbad000e08159832d000024d4020000000 \
    /archive/log.2
```

Source Code

`java/examples/RetrieveData.java`

RetrieveMetadata

Retrieves data (and metadata) from a specified 5800 system server.

**Note** – RetrieveMetadata always displays the time in the time zone of the shell running the program.

**Synopsis**

```
java RetrieveMetadata <IP | HOST> <OID> [OPTIONS]
```

**Description**

Retrieves a data record and metadata from the 5800 system server. The metadata record identified by the supplied OID is printed to stdout.

**Options**

- `-h`

Print this message.

**Examples**

```java
java RetrieveMetadata 10.152.0.12 \
    0200004f75ee01094cc13e11dbbad000e08159832d000024d4020000000
```

Source Code

`java/examples/RetrieveMetadata.java`

AddMetadata

Adds a metadata record to an already stored object.
Synopsis

java AddMetadata <IP | HOST> <OID> [OPTIONS]

Description

Adds a new metadata record to an existing data object.

Options

-\texttt{-m <name>=<value>}

Any number of -\texttt{m} options can be specified. Each option specifies a single (name, value) pair. <name> should be specified in the format \texttt{<namespace>.<attribute>}. Use double quotes if \texttt{<value>} is a string containing spaces.

-\texttt{-h}

Print this message.

Examples

java AddMetadata server \ 0200004f75ee01094cc13e11dbbad000e08159832d000024d0200000000@ \ -\texttt{-m filesystem.mimetype=\textquotedbl}image/jpeg\textquotedbl\

java AddMetadata server \ 0200004f75ee01094cc13e11dbbad000e08159832d000024d0200000000@ \ -\texttt{-m system.test.type\_char=do re mi}\

java AddMetadata server \ 0200004f75ee01094cc13e11dbbad000e08159832d000024d0200000000@ \ -\texttt{-m system.test.type\_string=\textquote{fa so la}}\

java AddMetadata server \ 0200004f75ee01094cc13e11dbbad000e08159832d000024d0200000000@ \ -\texttt{-m system.test.type\_long=123}\

java AddMetadata server \ 0200004f75ee01094cc13e11dbbad000e08159832d000024d0200000000@ \ -\texttt{-m system.test.type\_double=1.23}\

java AddMetadata server \ 0200004f75ee01094cc13e11dbbad000e08159832d000024d0200000000@ \ -\texttt{-m system.test.type\_date=1952-10-27}\

java AddMetadata server \ 0200004f75ee01094cc13e11dbbad000e08159832d000024d0200000000@ \ -\texttt{-m system.test.type\_time=23:30:29}\

java AddMetadata server \ 0200004f75ee01094cc13e11dbbad000e08159832d000024d0200000000@ \ -\texttt{-m system.test.type\_timestamp=1952-10-27 23:30:29.999}\

java AddMetadata server \ 0200004f75ee01094cc13e11dbbad000e08159832d000024d0200000000@ \ -\texttt{-m name1=value1 -m name2=\textquote{value 2}}}
Source Code
java/examples/AddMetadata.java

DeleteRecord
DeletestheSun5800systemmetadatarecordassociatedwithanOID.

Synopsis
java DeleteRecord <IP | Host> <OID> [OPTIONS]

Description
Deletestherecordwiththespecified OID. If this record is the only record pointing to the data, the data will also be deleted.

Options
-v
Printdeleted OID to stdout.

-h
Printthismessage.

Examples
java DeleteRecord server \n 0200004f75ee01094cc13e11dbbad000e08159832d000024d4020000000

Source Code
java/examples/DeleteRecord.java

Query
Queriesa5800systemserverformetadatarecordsthathmatchthequerystringpassedonthecommandline.

Note – Query requires the T..ZUTC format. For example, 1952-10-27T00:30:29.999Z.

Synopsis
java Query <IP | HOST> <QUERY> [OPTIONS]
Description

Queries for metadata records. QUERY is of the form:

\<name1>=\'\<value1\>' AND \<name2>=\'\<value2\>' OR ... 

See the examples below for formatting of various types of values. The OID and any specified fields of metadata records that match the query are printed to stdout.

\<name\> should be specified in the format \<namespace\>.\<attribute\>.

Note that names that are keywords need to be enclosed in escaped double quotes (\"\<name\>\"=\'\<values\>\'). Refer to the list of keywords in Chapter 4, “Sun StorageTek 5800 System Query Language,” in Sun StorageTek 5800 System Client API Reference Guide. Also note that some shells such as csh might not accept the escaped quotes because they are embedded in other quotes.

Options

- \s <FIELD>

Specifies a field to be retrieved, much like an SQL select clause. To retrieve multiple fields, repeat this option. By default, the results are returned as a list of OIDs.

- \n <number of results>

The maximum number of metadata records or OIDs that will be returned. The default is 1000.

- \h

Print this message.

Examples

In the following examples, “first” is a keyword.

```
java Query server "book.author="King"
java Query server "\"first\"=a"
java Query 10.152.0.12 "mp3.artist=The Beatles\ AND mp3.album=Abbey Road"
java Query 10.152.0.12 "mp3.artist=The Beatles" -s mp3.album -s mp3.title
java Query 10.152.0.12 system.test.type_char="do re mi"
java Query 10.152.0.12 system.test.type_string="fa so la"
java Query 10.152.0.12 system.test.type_long=123
java Query 10.152.0.12 system.test.type_double=1.23
java Query 10.152.0.12 system.test.type_binary=x\0789abcdef"
java Query 10.152.0.12 system.test.type_date="2010-10-20"
java Query 10.152.0.12 system.test.type_time="23:30:29"
java Query 10.152.0.12 system.test.type_timestamp="{timestamp\'2010-10-20T23:30:29.123Z\}'"```
Source Code
java/examples/Query.java

RetrieveSchema
Returns the schema defined on a 5800 system server to standard output.

Synopsis
java RetrieveSchema [OPTIONS] <IP | HOST>

Description
Retrieves the metadata schema from a 5800 system server, printing it to stdout.

Options
-h
Print this message.

Examples
java RetrieveSchema archivehost

Source Code
java/examples/RetrieveSchema.java

GetDate
Gets the date.

Synopsis
java GetDate <IP | HOST> [OPTIONS]

Description
Gets the current date used to compute time setting and checking during store and delete operations.

Options
-h
Print this message.
Examples

java GetDate server

Source Code

java/examples/GetDate.java

C Example Applications

This section provides detailed information on the C example applications provided with the 5800 system client SDK.

Example Overview

Included with the 5800 system SDK are several command-line example applications that demonstrate the use of the C API. The example applications are located in the SDK under c/examples. Appropriate libraries are supplied for Solaris SPARC, Solaris x86, Red Hat Linux, and Windows.

Software Requirements

- In Solaris and Linux, set the LD_LIBRARY_PATH environment variable to $SDK directory name/c/OS/lib where $SDK directory name is the directory into which you unzipped the 5800 system SDK and OS is either Solaris or Linux. For example:
  StorageTek500_SDK_1_1_82/c/Solaris/lib
- In Microsoft Windows 2003:
  - The example programs will run if they are run as installed in the default build directory. However, if you have moved them elsewhere, the location of the library files (DLLs) must be added to the PATH environment variable as follows:
    C:\StorageTek500_SDK_1_1_82\c\Win32\lib

  To edit the windows PATH environment variable:
  1. Click the Start button.
  2. Right-click My Computer and select properties to launch System Properties.
  3. Click the Advanced tab.
  4. Click Environment Variables.
  5. Under System Variables, scroll down and click Path.
  6. Click Edit to launch Edit System Variable.
7. Add the full path name of the SDK `lib` directory to the `PATH` environment variable. Make certain each path name is separated by a semicolon (`;`).

8. Click OK to close each window.

- Add `C:\Program Files\Java\jdk_version\bin` to the `PATH` environment variable where `jdk_version` is the version, for example, `jdk5.0`.

To edit the windows `PATH` environment variable:

1. Click the Start button.
2. Right-click `My Computer` and select properties to launch System Properties.
3. Click the Advanced tab.
4. Click Environment Variables.
5. Under System Variables, scroll down and click Path.
6. Click Edit to launch Edit System Variable.
7. Add the Java path name to the `PATH` environment variable. Make certain each path name is separated by a semicolon (`;`).
8. Click OK to close each window.

Also see "Software Requirements" on page 13.

### Building the C Example Applications

To build the C example applications, go to the `c/examples` directory and run `make`. This will build the example applications and put them in the `c/examples/<OS>/build` directory.

Each C example application can be built separately by running `make program_name`.

### Running a C Example Application

Once you have built the C example applications, go to the `c/examples/<OS>/build` directory and execute the binary file with the appropriate command line. The examples depend on `libhoneycomb.so`.

### About the C Example Application Source Code

First, the function `parseCommandline` is called to parse the command line and store the information in a `struct` called `Commandline`. Next, any files that contain data to be sent to the 5800 system server are opened. The appropriate 5800 system C API is then called. Finally, output is delivered back to either standard output, a file, or both. Refer to the comments in the sample code for further details.
Example Applications

The following C example applications are included with the 5800 system client SDK:

- “StoreFile” on page 30
- “CheckIndexed” on page 31
- “RetrieveData” on page 32
- “RetrieveMetadata” on page 32
- “AddMetadata” on page 33
- “DeleteRecord” on page 34
- “Query” on page 35
- “RetrieveSchema” on page 36

StoreFile

Stores a file and associated metadata on a 5800 system server.

Synopsis

StoreFile <IP | HOST> <FILE> [OPTIONS]

Description

Stores a file and its associated metadata record. If no -m options are specified, a metadata record without user content is generated. The OID of the metadata record is printed to stdout.

Options

- -m <name>=<value>

Any number of -m options can be specified. Each option specifies a single (name, value) pair.

- -h

Print this message.

Examples

StoreFile server /var/log/messages
StoreFile server ~/journal
StoreFile server myfile.jpg -m filesystem.mimetype="image/jpeg"
StoreFile 10.152.0.12 myfile -m system.test.type_char="do re mi"
StoreFile 10.152.0.12 myfile -m system.test.type_string="fa so la"
### CheckIndexed

Ensure an object is queryable. Checks if the metadata for an object is present in the query engine, and inserts the metadata if it is not present.

#### Synopsis

CheckIndexed <IP | HOST> <OID> [OPTIONS]

#### Description

Check with the 5800 systems server to determine if the specified OID has become queryable. If not, attempt to make it queryable.

A short message about the supplied OID is printed to stdout:

- Object *OID* was already queryable.
- Object *OID* not yet queryable.
- Object *OID* has now been made queryable.

#### Options

- `-h`

Print this message.

#### Examples

CheckIndexed archivehost \ 0200004f75ee01094cc13e11d8bbad000e08159032d000024d4020000000 CheckIndexed 10.152.0.12 \ 0200004f75ee01094cc13e11d8bbad000e08159032d000024d4020000000
Source Code

c/examples/CheckIndexed.c

RetrieveData

Retrieves a data object from a 5800 system server.

Synopsis

```
RetrieveData <IP | HOST> <OID> <FILE> [OPTIONS]
```

Description

Retrieves data from the 5800 system. The OID specifies what data to retrieve. Data is written to FILE, if specified, otherwise to stdout.

Options

```
-h
```

Print this message.

Examples

```
RetrieveData storagetek \
0200004f75ee01094cc13e11dbbad000e08159b32d000024d4020000000 \
/archive/log.1
```

Source Code

```
c/examples/RetrieveData.c
```

RetrieveMetadata

Retrieves a metadata record from a specified 5800 system server.

Synopsis

```
RetrieveMetadata <IP | HOST> <OID> [OPTIONS]
```

Description

Retrieves metadata from the 5800 system. The OID specifies what data to retrieve. Metadata is printed to stdout.
Options
- h

Print this message.

Examples
RetrieveMetadata archivehost \ 0200004f75ee01094cc13e11dbbad0000e08159832d000024d40200000000 RetrieveMetadata 10.152.0.12 \ 0200004f75ee01094cc13e11dbbad0000e08159832d000024d40200000000

Source Code
c/examples/RetrieveMetadata.c

AddMetadata
Adds a metadata record to existing data.

Synopsis
AddMetadata <IP | HOST> <OID> [OPTIONS]

Description
Adds a new metadata record to an existing data object.

Options
- m <name>=<value>

Any number of -m options can be specified. Each option specifies a single (name, value) pair.

- h

Print this message.

Examples
AddMetadata server \ 0200004f75ee01094cc13e11dbbad0000e08159832d000024d4020000000 \ -m filesystem.mimetype="image/jpeg"
AddMetadata server \
  0200004f75ee01094cc13e11dbbad000e08159832d000024d40200000000 \
  -m system.test.type_char="do re mi"
AddMetadata server \
  0200004f75ee01094cc13e11dbbad000e08159832d000024d40200000000 \
  -m system.test.type_string="fa so la"
AddMetadata server \
  0200004f75ee01094cc13e11dbbad000e08159832d000024d40200000000 \
  -m system.test.type_long=123
AddMetadata server \
  0200004f75ee01094cc13e11dbbad000e08159832d000024d40200000000 \
  -m system.test.type_double=1.23
AddMetadata server \
  0200004f75ee01094cc13e11dbbad000e08159832d000024d40200000000 \
  -m system.test.type_date=1992-10-27
AddMetadata server \
  0200004f75ee01094cc13e11dbbad000e08159832d000024d40200000000 \
  -m system.test.type_time=23:30:29
AddMetadata server \
  0200004f75ee01094cc13e11dbbad000e08159832d000024d40200000000 \
  -m system.test.type_timestamp="1992-10-27T23:30:29"
AddMetadata server \
  0200004f75ee01094cc13e11dbbad000e08159832d000024d40200000000 \
  -m name1=value1 -m name2="value 2"

Source Code
c/examples/AddMetadata.c

DeleteRecord
Deletes a record associated with an OID.

Synopsis
DeleteRecord <IP | HOST> <OID> [OPTIONS]

Description
Deletes a record associated with an OID. The OID specifies which record to delete. The record consists of all metadata associated with the OID, or the data if it is a data OID. The OID itself becomes inaccessible. If this OID is the last OID associated with the data, the data is also deleted.
Options

-\v
Print deleted OID to stdout.

-\h
Print this message.

Examples

DeleteRecord server 0200004f75ee01094cc13e11dbbad000e08159832d000024d40200000000

Source Code

c/examples/DeleteRecord.c

Query

Queries a 5800 system server for metadata records that match the query string passed on the command line.

Note – Query requires the T..Z UTC format. For example, 1952-10-27T00:30:29.999Z.

Synopsis

Query <IP | HOST> <QUERY> [OPTIONS]

Description

Queries for metadata records. QUERY is of the form:

<name1>='value1' AND <name2>='value2' OR ...

See the examples below for formatting of various types of values. The OID and any specified fields of metadata records that match the query are printed to stdout.

<name> should be specified in the format <namespace>.<attribute>.

Note that names that are keywords need to be enclosed in escaped double quotes ("\<name\>"="\<value\>"). Refer to the list of keywords in Chapter 4, "Sun StorageTek 5800 System Query Language," in Sun StorageTek 5800 System Client API Reference Guide. Also note that some shells such as csh may not accept the escaped quotes because they are embedded in other quotes.
Options

- **s <FIELD>**
  
  Print out results as metadata name-value records. Use as many `-s` switches as needed to define all fields that will be printed to stdout.

- **n <number of results>**
  
  The maximum number of metadata records or OIDs that will be returned. The default is 1000.

- **h**
  
  Print this message.

Examples

In the following examples, “first” is a keyword.

Query archivehost "book.author="King"
Query archivehost "\"first\"=a"
Query archivehost system.test.type_char="do re mi"
Query archivehost system.test.type_string="fa so la"
Query archivehost system.test.type_long=123
Query archivehost system.test.type_double=1.23
Query archivehost system.test.type_binary="\x0789abcdef"
Query archivehost system.test.type_date="2010-10-20"
Query archivehost system.test.type_time="22:10:29"
Query archivehost system.test.type_timestamp="{timestamp '2010-10-20T23:30:29.123Z'}"
Query 10.152.0.12 "mp3.artist='The Beatles' AND mp3.album='Abbey Road'"
Query 10.152.0.12 "mp3.artist='The Beatles' -s mp3.album -s mp3.title"
Query 10.152.0.12 "system.test.type_timestamp={timestamp '1952-10-27T08:30:29.999Z'}"

Source Code

c/examples/Query.c

RetrieveSchema

Prints metadata attributes to stdout.

Synopsis

`RetrieveSchema <IP | HOST> [OPTIONS]`

Description

Retrieves the schema from a 5800 system server, printing it to stdout.
Options
   -h

Print this message.

Examples
   RetrieveSchema archivehost

Source Code
   c/examples/RetrieveSchema.c
Sun StorageTek 5800 System Emulator

This chapter provides information on running the 5800 system emulator.

The following topics are discussed:

- "Introduction to the Emulator" on page 39
- "Software Requirements" on page 39
- "Emulator Startup" on page 40
- "Emulator Shutdown" on page 40
- "Schema Modification" on page 40
- "Emulator Event Log" on page 41
- "Emulator Configuration File" on page 41

**Introduction to the Emulator**

The 5800 system emulator mimics the behavior of a 5800 system server. This feature enables you to test software being developed for a 5800 system without having to access a 5800 system server. The emulator stores all data and metadata on the local hard drive. This data is by default stored in the `emulator/var` directory.

**Software Requirements**

The 5800 system emulator requires at minimum the JDK 1.5 software.
Emulator Startup

The 5800 system emulator can run on Solaris, Linux, or Windows environments. To start the emulator, go to the emulator/bin directory and execute the start.sh file for Solaris and Linux environments or the start.bat file for the Windows environment. The emulator will be listening on port 8080 of the machine you start it on.

See “Emulator Configuration File” on page 41 for directions on changing the port number.

Emulator Shutdown

Connect to port 8080 of the machine running the 5800 system emulator with your web browser (http://localhost:8080 if you are on your local system). Click on HttpContext [/admin], then Click here to shutdown the emulator.

Schema Modification

To add a custom schema to the 5800 system, create an XML file detailing your custom schema. Refer to the XML files in the config directory for examples of a custom schema. Also, see “Configuring Metadata and File System View” in Sun StorageTek 5800 System Administration Guide.

Once your XML schema file is complete, stop the emulator and run the metadata_merge_config.sh script (metadata_merge_config.bat on Windows) located in the bin directory. This script takes one command-line argument, which is the full path to your XML schema file. The emulator should be stopped while updating the schema.

To use a new schema in the emulator you should first do a manual wipe of the emulator contents.

To Manually Clear the Emulator Contents

1. Shut down the emulator if it is currently running.

2. Remove the emulator var directory and all of its contents.
   For example:
   ```
   rm -rf SDK directory name/emulator/var
   ```
   where SDK directory name is the directory into which you unzipped the 5800 system SDK.

3. Run the metadata_merge_config program to activate the new schema.
Restart the emulator.

**Emulator Event Log**

The emulator event log is automatically stored under `/emulator/logs/emulator.log`. The event log contains all the transactions that the emulator has processed, as well as startup and shutdown information. This log can be very helpful in debugging your 5800 system client applications.

**Emulator Configuration File**

The emulator configuration file is located at `/emulator/config/emulator.config`. This file contains settings for configuring the emulator. To configure the emulator to listen on a different port, add the line:

```
honeycomb.protocol.port = port_number
```

to the `emulator.config` file, where `port_number` is the port the emulator will listen on. For further information on the configuration file, refer to the *Sun StorageTek 5800 Administrator's Guide*. 

Index

A
AddMetadata, 18
  C, 33-34
  Java, 23-25
applications
  C API, deployment, 15
  examples, C, 28-37
  examples, Java, 19
  examples, summary, 17-18
  Java API, deployment, 15
attributes, 14

C
example applications, See example applications, C
C library directory, 15
CheckIndexed
  C, 31-32
  Java, 21-22
configuration file, emulator, 41

D
data types, 13
DeleteRecord, 18
  C, 34-35
  Java, 25

E
emulator
  clearing, 40-41
  configuration file, 41
  event log, 41
  introduction, 39
  reconfigure port, 41
  requirements, 39
  schema modification, 40-41
  shutdown, 40
  startup, 40
  event log, 41
example applications
  C
    AddMetadata, 33-34
    building, 29
    CheckIndexed, 31-32
    DeleteRecord, 34-35
    overview, 28
    Query, 35-36
    requirements, 13
    RetrieveData, 32
    RetrieveMetadata, 32-33
    RetrieveSchema, 36-37
    running, 29
    source code, 29
    StoreFile, 30-31
Java
    AddMetadata, 23-25
    building, 19
    CheckIndexed, 21-22
    DeleteRecord, 25
example applications, Java (Continued)
  GetDate, 27-28
  overview, 19
  Query, 25-27
  requirements, 19
  RetrieveData, 22-23
  RetrieveMetadata, 23
  RetrieveSchema, 27
  running, 19
  source code, 20
  StoreFile, 20-21

PATH environment, changing for Windows, 19

Query, 18
  C, 35-36
  Java, 25-27
  query language, 14

RetrieveData, 18
  C, 32
  Java, 22-23
RetrieveMetadata, 18
  C, 32-33
  Java, 23
RetrieveSchema, 18
  C, 36-37
  Java, 27

schema modification, 40-41
  emulator, clearing, 40-41
SDK
  application deployment, 15
  components, 12
  emulator, 39
  emulator, clearing, 40-41
  example applications, 17-18
  installation instructions, 13
  overview, 11-12
  system requirements, 12-13
  terms of use, 12
  semantics, 13-14
  attributes, 14
  data and metadata, 13
  metadata schema, 14
  namespace, 14

installation instructions, 13

namespace, definition of, 14

operating systems supported, 12-13

Java example applications, 19
source code
   C, summary, 28
   Java, summary, 20
StoreFile, 17-18
   C, 30-31
   Java, 20-21
system requirements, 12-13

W
Windows PATH environment variable, changing, 19