# Contents

1 Overview
   1.1 Features ................................................................. 1
   1.2 Technical Support .................................................. 2

2 Installation ......................................................... 3
   2.1 How to unpack and install the Search Appliance ......................... 3
      2.1.1 Console Menu .................................................... 3
      2.1.2 Front Panel LCD ................................................ 5
   2.2 Customizing the Search Appliance’s Appearance .......................... 8

3 Operation ........................................................... 9
   3.1 Running the Administrative Interface .................................. 9
   3.2 First Time Run: Quick Start ......................................... 9
   3.3 Administrative Interface Overview .................................... 11
      3.3.1 Entry ............................................................. 12
      3.3.2 Basic Walk Settings .............................................. 12
      3.3.3 All Walk Settings ............................................... 13
      3.3.4 Search Settings ................................................ 13
      3.3.5 Profile Tools .................................................... 13
      3.3.6 Walk Status ..................................................... 16
      3.3.7 Query Log ........................................................ 17
      3.3.8 Test Search ....................................................... 17
      3.3.9 Live Search ...................................................... 18
      3.3.10 Profiles ........................................................ 18
3.5.6 DBWalker .................................................. 28
3.5.7 URL File .................................................. 28
3.5.8 URL URL .................................................. 28
3.5.9 Single Page ............................................... 29
3.5.10 Page File ............................................... 29
3.5.11 Page URL ............................................... 29
3.5.12 Strip Queries .......................................... 29
3.5.13 Ignore Case ............................................ 30
3.5.14 Extra Domains ......................................... 30
3.5.15 Extra Networks ........................................ 30
3.5.16 Extra URLs REX ....................................... 30
3.5.17 Exclusion REX ......................................... 31
3.5.18 Exclusion Prefix ....................................... 31
3.5.19 Exclude by Field ...................................... 32
3.5.20 Additional Fields ...................................... 32
3.5.21 Data from Field ....................................... 33
3.5.22 Required REX .......................................... 36
3.5.23 Required Prefix ....................................... 36
3.5.24 Max Page Size ......................................... 36
3.5.25 Max Pages ............................................... 36
3.5.26 Max Bytes ............................................... 37
3.5.27 Max Depth .............................................. 37
3.5.28 Max URL Size .......................................... 37
3.5.29 Max Requests .......................................... 37
3.5.30 Max Connection Lifetime ............................ 37
3.5.31 Page Timeout ........................................... 37
3.5.32 Meta Tags ............................................... 38
3.5.33 Standard Meta ......................................... 38
3.5.34 All Meta ................................................ 38
3.5.35 Storage Charset ........................................ 38
3.5.36 Source Default Charset ........................................ 38
3.5.37 XML UTF-8 ....................................................... 39
3.5.38 Keep HTML ....................................................... 39
3.5.39 Keep Links ....................................................... 39
3.5.40 Remove Common ............................................... 40
3.5.41 Ignore Tags ..................................................... 40
3.5.42 Keep Tags ....................................................... 40
3.5.43 Ignore Characters ............................................. 40
3.5.44 Plugin Split ..................................................... 40
3.5.45 Language Analysis ............................................ 41
3.5.46 CJK Mode ....................................................... 41
3.5.47 Word Definition ............................................... 42
3.5.48 Text Search Mode ............................................ 42
3.5.49 Attribute Compare Mode ..................................... 43
3.5.50 Index Fields ..................................................... 43
3.5.51 Compound Index Fields ..................................... 44
3.5.52 Extra Indexes .................................................. 44
3.5.53 Spell-check Dictionaries ..................................... 44
3.5.54 Primer Type ..................................................... 45
3.5.55 Primer URLs ................................................... 45
3.5.56 Login Info ....................................................... 47
3.5.57 Proxy .......................................................... 47
3.5.58 Proxy Login Info .............................................. 47
3.5.59 Cookie Source Path ......................................... 48
3.5.60 Off-Site Pages ................................................ 48
3.5.61 Off-Site Components ........................................ 48
3.5.62 Stay Under ..................................................... 48
3.5.63 Prevent Duplicates ........................................... 48
3.5.64 Duplicate Check Fields ...................................... 48
3.5.65 Store Refs ...................................................... 49
CONTENTS

3.5.66 Inline Iframes .......................................................... 49
3.5.67 Max Frames ............................................................. 49
3.5.68 Execute JavaScript .................................................. 49
3.5.69 Fetch JavaScript ..................................................... 50
3.5.70 JavaScript String Links .......................................... 50
3.5.71 Debug JavaScript ................................................... 50
3.5.72 JavaScript Memory ................................................ 50
3.5.73 JavaScript Timeout ................................................ 50
3.5.74 Protocols ............................................................... 51
3.5.75 HTTP Version ........................................................ 51
3.5.76 SSL Client Protocols ............................................ 51
3.5.77 Authentication Schemes .......................................... 51
3.5.78 Embedded Security ............................................... 51
3.5.79 Entropy Source ..................................................... 52
3.5.80 Multiple Fetches ................................................... 52
3.5.81 Follow Cross-Site Links ......................................... 52
3.5.82 Max Redirects ........................................................ 52
3.5.83 Empty Form Redirects ............................................ 52
3.5.84 Index Name ............................................................ 53
3.5.85 DNS Mode .............................................................. 53
3.5.86 User Agent ............................................................ 53
3.5.87 Mime Types .......................................................... 53
3.5.88 Respect Expires Header ......................................... 53
3.5.89 Default Refresh Time ............................................. 54
3.5.90 Minimum Refresh Time ........................................... 54
3.5.91 Maximum Refresh Time ......................................... 54
3.5.92 Maximum Process Size ......................................... 54
3.5.93 Maximum Load Average ........................................ 54
3.5.94 Replication Settings .............................................. 55
3.5.95 Batch Rows ........................................................... 55
3.5.96 Batch Size ............................................................ 55
3.5.97 Batch Idle .......................................................... 55
3.5.98 Log Replication .................................................... 55

3.6 Search Settings ....................................................... 55
3.6.1 Notes ............................................................... 56
3.6.2 Query Logging ..................................................... 56
3.6.3 Rotate Schedule ................................................... 56
3.6.4 Email ............................................................... 56
3.6.5 Result Order ....................................................... 56
3.6.6 Results Style ...................................................... 57
3.6.7 Allow RSS ......................................................... 57
3.6.8 Format XSL Output ............................................... 57
3.6.9 XSL Engine ....................................................... 57
3.6.10 XSL File ........................................................ 58
3.6.11 Abstract Style .................................................. 58
3.6.12 Abstract Length ............................................... 58
3.6.13 Max Title Length ............................................... 58
3.6.14 Max URL Display Length .................................... 58
3.6.15 Results per Page ................................................ 59
3.6.16 Max User Results per Page .................................. 59
3.6.17 Page Links Shown .............................................. 59
3.6.18 Results per Site ................................................ 59
3.6.19 Allow site: syntax .............................................. 60
3.6.20 Results Width .................................................. 60
3.6.21 Box Color ........................................................ 60
3.6.22 Display Thunderstone logo on results ..................... 60
3.6.23 Show Advanced Search ....................................... 60
3.6.24 Results Highlighting .......................................... 61
3.6.25 Context Highlighting .......................................... 61
3.6.26 PDF Query Highlighting ...................................... 61
3.6.27 Font ................................................................. 61
3.6.28 Display Charset ............................................... 62
3.6.29 Top HTML and Bottom HTML .............................. 62
3.6.30 Enable Sherlock ............................................... 62
3.6.31 Top Best Bet Title ............................................ 63
3.6.32 Right Best Bet Title ......................................... 63
3.6.33 Top Best Bet Group ........................................... 63
3.6.34 Right Best Bet Group ........................................ 63
3.6.35 Top Best Bet Box Color ..................................... 63
3.6.36 Right Best Bet Box Color ................................... 63
3.6.37 Top Best Bet Border Style .................................. 64
3.6.38 Right Best Bet Border Style ............................... 64
3.6.39 Right Best Bet Box Width ................................... 64
3.6.40 Authorization Method ....................................... 64
3.6.41 Login Cookies ................................................ 64
3.6.42 Login URL ...................................................... 65
3.6.43 Basic/NTLM/file Cookie Type ............................... 65
3.6.44 Login Verification URL ...................................... 66
3.6.45 Unauthorized Result Query ................................ 66
3.6.46 Username Fixup .............................................. 66
3.6.47 Max Docs to Auth-Check ................................... 67
3.6.48 Successful Auth Result Limit .............................. 67
3.6.49 Total Auth Timeout ........................................... 68
3.6.50 Allow Authorization URL ................................... 68
3.6.51 Authorization Caching ....................................... 68
3.6.52 Debug Results Authorization ............................... 69
3.6.53 Show Authorization Info .................................... 69
3.6.54 Enable Spell Check .......................................... 69
3.6.55 Suggest Time Limit ......................................... 69
3.6.56 Number of Suggestions ..................................... 70
3.6.57 Synonyms .................................................. 70
3.6.58 Main Thesaurus ........................................... 70
3.6.59 Secondary Thesaurus ................................... 70
3.6.60 Translate Boolean ...................................... 71
3.6.61 Allow the @ Operator .................................. 71
3.6.62 Allow Linear ............................................. 71
3.6.63 Allow NOT Logic ....................................... 71
3.6.64 Allow Post-Processing ................................. 71
3.6.65 Allow Wildcards ....................................... 72
3.6.66 Allow Leading Wildcards .............................. 72
3.6.67 Single-Word Wildcards ................................. 72
3.6.68 Allow WITHIN Operators .............................. 72
3.6.69 Require All Words ..................................... 72
3.6.70 Resolve Phrase Noise Words ......................... 73
3.6.71 Keep Noise Words .................................... 73
3.6.72 Noise List ................................................ 73
3.6.73 Search Timeout ......................................... 73
3.6.74 Show Error Messages ................................. 74
3.6.75 Debug SQL Level ....................................... 74
3.6.76 Fast Result Counts .................................... 74
3.6.77 Proximity ............................................... 74
3.6.78 Language Characters .................................. 75
3.6.79 Word Forms ............................................ 75
3.6.80 Custom Suffix List .................................... 75
3.6.81 Custom Suffix Default Removal ...................... 76
3.6.82 Custom Suffix Min Length ............................ 76
3.6.83 Word Ordering .......................................... 76
3.6.84 Word Proximity ........................................ 76
3.6.85 Database Frequency .................................. 76
3.6.86 Document Frequency ................................. 77
3.6.87 Position in Text ................................................. 77
3.6.88 Clicks from Home ............................................. 77
3.6.89 Ranked Rows ..................................................... 77
3.6.90 XML Export Variables ....................................... 77
3.6.91 File URL Format .............................................. 78
3.6.92 Redirect Format ............................................... 78
3.6.93 Phishing Protection .......................................... 78
3.6.94 Decode Displayed URLs .................................... 78
3.6.95 Results Caching .............................................. 79
3.6.96 Max Cache Entry Age ....................................... 79
3.6.97 Max Cache Size ............................................... 79
3.6.98 Min Search Time ............................................. 79
3.6.99 Visible ......................................................... 80

3.7 Results Authorization ........................................... 80
3.7.1 Results Authorization Crawl Settings ..................... 81
3.7.2 Results Authorization Search Settings .................... 81

3.8 Meta Search - Search multiple profiles as one ............. 81
3.8.1 Profile Creation ............................................... 81
3.8.2 Meta Search Walk Settings .................................. 81
3.8.3 Search Settings ............................................... 82

3.9 Access Control .................................................. 83
3.9.1 User Groups .................................................... 83
3.9.2 Object hierarchy .............................................. 83
3.9.3 Access Control Lists ........................................ 84
3.9.4 Determining Effective Rights .............................. 84
3.9.5 Required Rights for Admin Actions ....................... 85

3.10 Running the Search Interface ................................ 87

3.11 Maintenance .................................................... 88
3.11.1 Information ................................................... 88
3.11.2 Install/Upgrade ............................................... 89
3.11.3 Logs ......................................................... 90
3.11.4 System Settings .......................................... 91
3.11.5 Appliance system access ................................. 101

4 Procedures and Examples .................................... 107
4.1 Searching your Index .................................... 107
4.2 Similarity Searching ....................................... 108
4.3 Using the Thesaurus Feature ............................... 109
4.4 Getting Software Updates .................................. 110
4.5 Page Exclusion, Robots.txt, and Meta-robots .......... 110
4.6 Indexing Other Sites ....................................... 112
4.7 Indexing Individual Pages ................................. 112
4.8 Reindexing on a Schedule ................................. 113
4.9 Checking for Web Server Errors ......................... 113
4.10 Removing Pages from the Database .................... 113
4.11 Erasing the Entire Database .............................. 113
4.12 Using Multiple Databases ................................. 113
4.13 Integrating the Search Appliance with your Site .... 113
    4.13.1 Static Host ........................................ 114
    4.13.2 Dynamic Host and HTML ......................... 115
    4.13.3 Dynamic Host and XML ............................ 117
4.14 Search Result RSS Feeds ................................. 119
4.15 OpenSearch Support ..................................... 119
4.16 Using Best Bets .......................................... 119
    4.16.1 Quick Creation ...................................... 119
    4.16.2 Fully Customized ................................... 120
4.17 Using Access Control .................................... 121
    4.17.1 Initial Lockdown .................................... 121
    4.17.2 Example: User with Complete Control on One Profile 121
    4.17.3 Example: User with Look and Feel Control on All Profiles 121
4.18 Indexing File Servers .................................... 122
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.19 Replication</td>
<td>122</td>
</tr>
<tr>
<td>4.19.1 Replication Overview</td>
<td>122</td>
</tr>
<tr>
<td>4.19.2 Procedure</td>
<td>123</td>
</tr>
<tr>
<td>4.19.3 DataLoad API</td>
<td>124</td>
</tr>
<tr>
<td>4.20 Additional Fields</td>
<td>130</td>
</tr>
<tr>
<td>4.20.1 Overview</td>
<td>130</td>
</tr>
<tr>
<td>4.20.2 Populating</td>
<td>130</td>
</tr>
<tr>
<td>4.20.3 Sorting</td>
<td>131</td>
</tr>
<tr>
<td>4.20.4 Searching</td>
<td>131</td>
</tr>
<tr>
<td>4.21 DBWalker</td>
<td>131</td>
</tr>
<tr>
<td>4.21.1 Overview</td>
<td>131</td>
</tr>
<tr>
<td>4.21.2 Configuration Overview</td>
<td>132</td>
</tr>
<tr>
<td>4.21.3 DBWalker Output Overview</td>
<td>132</td>
</tr>
<tr>
<td>4.21.4 DBWalker Authentication Overview</td>
<td>132</td>
</tr>
<tr>
<td>4.21.5 Obtaining DBWalker</td>
<td>133</td>
</tr>
<tr>
<td>4.21.6 Managing DBWalker</td>
<td>133</td>
</tr>
<tr>
<td>4.21.7 DBWalker Global Options</td>
<td>134</td>
</tr>
<tr>
<td>4.21.8 Managing DBWalker Configurations</td>
<td>135</td>
</tr>
<tr>
<td>4.21.9 Managing DBWalker Stylesheets</td>
<td>137</td>
</tr>
<tr>
<td>4.21.10 Adding Configurations to Profiles</td>
<td>137</td>
</tr>
<tr>
<td>4.22 SOAP API</td>
<td>138</td>
</tr>
<tr>
<td>4.22.1 SOAP Overview</td>
<td>138</td>
</tr>
<tr>
<td>4.22.2 SOAP API vs. XML Output</td>
<td>138</td>
</tr>
<tr>
<td>4.22.3 Getting the WSDL</td>
<td>138</td>
</tr>
<tr>
<td>4.22.4 Global vs. per-profile WSDLs</td>
<td>139</td>
</tr>
<tr>
<td>4.22.5 Configuring the SOAP Interface</td>
<td>139</td>
</tr>
<tr>
<td>4.22.6 C# example project</td>
<td>140</td>
</tr>
<tr>
<td>4.22.7 SOAP Links for Languages</td>
<td>140</td>
</tr>
<tr>
<td>4.22.8 SOAP API search Reference</td>
<td>141</td>
</tr>
<tr>
<td>4.22.9 SOAP API admin Reference</td>
<td>143</td>
</tr>
</tbody>
</table>
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.23</td>
<td>Thunderstone ISAPI Proxy Module</td>
<td>146</td>
</tr>
<tr>
<td>4.23.1</td>
<td>Overview</td>
<td>146</td>
</tr>
<tr>
<td>4.23.2</td>
<td>Requirements</td>
<td>147</td>
</tr>
<tr>
<td>4.23.3</td>
<td>Installing the Proxy Module</td>
<td>147</td>
</tr>
<tr>
<td>4.23.4</td>
<td>Post-Install Setup</td>
<td>148</td>
</tr>
<tr>
<td>4.23.5</td>
<td>Manually Configuring the Proxy Module</td>
<td>150</td>
</tr>
<tr>
<td>4.23.6</td>
<td>Troubleshooting the Proxy Module Authentication</td>
<td>153</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Reference</td>
<td>155</td>
</tr>
<tr>
<td>5.1</td>
<td>Database and File Usage</td>
<td>155</td>
</tr>
<tr>
<td>5.2</td>
<td>Walk Database Tables and Fields</td>
<td>156</td>
</tr>
<tr>
<td>5.3</td>
<td>Options Table Fields</td>
<td>158</td>
</tr>
<tr>
<td>5.4</td>
<td>Customizing the Search</td>
<td>159</td>
</tr>
<tr>
<td>5.5</td>
<td>Customizing the Walker</td>
<td>159</td>
</tr>
<tr>
<td>5.6</td>
<td>XML Elements in Search Results</td>
<td>159</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Search Interface Help</td>
<td>165</td>
</tr>
<tr>
<td>6.1</td>
<td>Forming a Query</td>
<td>165</td>
</tr>
<tr>
<td>6.1.1</td>
<td>Query Rules of Thumb</td>
<td>165</td>
</tr>
<tr>
<td>6.1.2</td>
<td>Overview of Query Abilities</td>
<td>166</td>
</tr>
<tr>
<td>6.1.3</td>
<td>Controlling Proximity</td>
<td>166</td>
</tr>
<tr>
<td>6.1.4</td>
<td>Ranking Factors</td>
<td>166</td>
</tr>
<tr>
<td>6.1.5</td>
<td>Keywords Phrases and Wild-cards</td>
<td>166</td>
</tr>
<tr>
<td>6.1.6</td>
<td>Applying Search Logic</td>
<td>167</td>
</tr>
<tr>
<td>6.1.7</td>
<td>Natural Language Query</td>
<td>168</td>
</tr>
<tr>
<td>6.1.8</td>
<td>Using the Special Pattern Matchers</td>
<td>168</td>
</tr>
<tr>
<td>6.1.9</td>
<td>Invoking Thesaurus Expansion</td>
<td>169</td>
</tr>
<tr>
<td>6.2</td>
<td>Using Word Forms</td>
<td>169</td>
</tr>
<tr>
<td>6.3</td>
<td>Controlling Proximity</td>
<td>170</td>
</tr>
<tr>
<td>6.4</td>
<td>Interpreting Search Results</td>
<td>170</td>
</tr>
<tr>
<td>6.4.1</td>
<td>Viewing Match Info</td>
<td>171</td>
</tr>
</tbody>
</table>
6.4.2 Finding Similar Documents .................................................. 171
6.4.3 Showing Document Parents .................................................. 171

A Third-Party Software ................................................................. 173
A.1 Antiword ............................................................................. 173
A.2 Aspell ............................................................................... 173
A.3 Catdoc xls2csv ................................................................. 174
A.4 Cole library ...................................................................... 174
A.5 iconv ............................................................................... 174
A.6 libxml2 ........................................................................... 174
A.7 Libxslt ............................................................................ 175
A.8 Libexslt .......................................................................... 175
A.9 JDBC drivers ................................................................. 176
  A.9.1 Oracle JDBC driver ..................................................... 176
  A.9.2 JTDS JDBC driver ...................................................... 180
  A.9.3 PostgreSQL JDBC driver ........................................... 180
  A.9.4 MySQL JDBC driver .................................................. 181
A.10 ppt2html, msg2html ......................................................... 181
A.11 SSL/HTTPS plugin .......................................................... 181
A.12 unrar .............................................................................. 184
A.13 unzip ............................................................................. 185
A.14 zlib ............................................................................... 186
A.15 SpiderMonkey (JavaScript-C) Engine ................................. 186
A.16 PDF/anytotx plugin ......................................................... 187
A.17 thttpd - throttling HTTP server ...................................... 187
A.18 RedHat Linux ................................................................... 187
A.19 CentOS Linux ............................................................... 188
A.20 Webmin .......................................................................... 188
A.21 Java ............................................................................... 188
A.22 OpenSSL RPM .............................................................. 194
A.23 RAID utilities ............................................................... 194
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.24 LCDpoc</td>
<td>195</td>
</tr>
<tr>
<td>A.25 GNU General Public License</td>
<td>195</td>
</tr>
<tr>
<td>A.26 GNU Lesser General Public License</td>
<td>202</td>
</tr>
<tr>
<td>A.27 GNU Library General Public License</td>
<td>212</td>
</tr>
<tr>
<td>A.28 Netscape Public License</td>
<td>221</td>
</tr>
</tbody>
</table>
Chapter 1

Overview

The Thunderstone Search Appliance is a web walking and indexing device that allows a web site administrator to provide a high quality retrieval interface to collections of HTML and other documents. It is an application of Texis and is written in Texis’s Web Script language named Vortex.

It consists primarily of the Texis binary program and two Vortex scripts that are run by the Texis CGI program on the Search Appliance and are accessed from a web browser.

One script provides the administrative interface, another provides the site walker and indexer, and the third provides the search function that end users see.

1.1 Features

Here are some of its features:

- One or more web sites may be indexed into a single database.
- Multiple databases may be maintained.
- It supports cookies.
- There is support for meta data.
- It supports proxy servers.
- Robots.txt and meta robots are respected.
- It provides a totally customizable search interface.
- It provides a totally customizable site walker/indexer.
- A web site may be copied to the local file system.

There are many more features and options to tailor the Search Appliance’s behavior to your needs.
1.2 Technical Support

Support for the Search Appliance is available via a searchable web message board. It is located at the following URL:

http://thunderstone.master.com/texis/master/search/msgboard.html

Anyone may read the discussions. To post a question or comment, you must create an account, which is free, and you must be logged in. Also, once you are signed up, you may “subscribe” to periodic email notifications of new postings to the board. You may select hourly, daily, or weekly notification of new postings.

If you subscribe to periodic notifications, and at some point in the future no longer wish to receive them, you may select “subscribe” again to enter the administrative area where you may delete your subscriptions.
Chapter 2

Installation

2.1 How to unpack and install the Search Appliance

For basic information about unpacking and installing the Search Appliance, refer to the Getting Started guide. This printed guide was shipped with the Search Appliance. In addition to the instructions it provides, it includes a sticker that lists important information unique to your Search Appliance. This information includes the original password and various network addresses.

Ensure that the Search Appliance is plugged into a UPS or other power conditioner.

Thunderstone is not responsible for damage caused due to environmental problems including, but not limited to, spikes, over/under voltage, outages, static discharge, excessive moisture or condensation, and extreme heat or cold.

Data loss may occur if the Search Appliance loses power without being shut down gracefully.

The Search Appliance is shipped with the network configuration specified when ordering. If no network configuration was specified then the Search Appliance is pre-configured to get its IP information automatically from DHCP. To change the network configuration if properly configured for your network, or to view the IP of the Search Appliance, you will need to use the console menu or front panel LCD.

2.1.1 Console Menu

To use the console menu you need to attach a keyboard and VGA monitor to the standard ports on the rear of the Search Appliance. You will see the following menu:
Thunderstone Search Appliance Summary on YYYY-MM-DD HH:MM:SS
Thunderstone phone: 216-820-2200
Ethernet 1 : xxxxx
IP Address : xxx.xxx.xxx.xxx
Index Admin Page : http://xxx.xxx.xxx.xxx/texis/dowalk
System Admin Page : https://xxx.xxx.xxx.xxx:999

Thunderstone Appliance Setup and Information
T) Thunderstone information
N) Network and system information
S) Setup network
F) drop Firewall/NAT (Allow all network access)
A) drop Admin restrictions (HTTPS,IP,Cipher requirements)
R) Reboot system
D) shutDown system
H) Help
L) Login (Thunderstone tech support only)
Enter your choice:

Choose an item by entering the letter on the left of the item.

- **T) Thunderstone information**
  will display information about the Search Appliance software version, license information.

- **N) Network and system information**
  will display information about the network and firewall settings.

- **S) Setup network**
  will prompt for network info and change settings accordingly. Entering “q” for any prompt will abandon changes and return to the menu.
  
  - **Use DHCP?(y/n/q)**
    Enter ”y” to get IP information automatically from DHCP and not ask further questions. Enter ”n” to specify the IP information manually.
  
  - **Enter IP address or q:**
    Enter the IP address in the form #.#.#.#.
  
  - **Enter net mask, blank, or q:**
    Enter the IP netmask in the form #.#.#.#.
  
  - **Enter gateway, blank, or q:**
    Enter the network gateway IP address in the form #.#.#.#.
  
  - **Primary nameserver, blank, or q:**
    Enter the IP of the primary nameserver in the form #.#.#.#.
  
  - **Secondary nameserver, blank, or q:**
    Enter the IP of the secondary nameserver in the form #.#.#.#. Leave blank for no secondary nameserver.
2.1. HOW TO UNPACK AND INSTALL THE SEARCH APPLIANCE

– **Enter hostname, blank, or q:**
Enter the host name of the Search Appliance. Ideally this will match whatever your DNS has for the assigned IP. At the very least it should be a fully qualified name such as “app.mydomain.com” so that email notifications etc. can work.

– **Enter DNS Domain Name, blank, or q:**
Enter the domain to use on unqualified host names, such ”mydomain.com”. Or leave blank to prevent unqualified names from resolving.

- **F) drop Firewall/NAT (Allow all network access)**
  will drop all firewall and NAT rules that you may have setup using the webmin web interface. It will also permanently delete the firewall and NAT configs so they will not come back on upon boot. This is most useful when you’ve accidentally created a firewall configuration that locks you out of the admin interface.

- **A) drop Admin restrictions (HTTPS,IP,Cipher requirements)**
  will remove all system-wide settings that restrict the web admin interface. This is useful if you’ve accidentally created a config that locks you out of the admin interface. This is permanent. Any desired restrictions will have to be re-added from the web interface.

- **R) Reboot system**
  will stop and restart the Search Appliance.

- **D) shutDown system**
  will cleanly stop and power down the Search Appliance.

- **H) Help**
  will show a short help message.

- **L) Login (Thunderstone tech support only)**
  will provide low-level system login for extended troubleshooting. This can only be used by Thunderstone technical support staff.

2.1.2 Front Panel LCD

Most machines, except SBE models, shipped since 2009 have a front panel LCD display and operation buttons. The display can show information about the Search Appliance’s configuration and activity level. It can also be used to change configurations and shutdown or reboot the Search Appliance.

There are 4 arrows used to scroll through menus and select items. The ”check” button is used like a keyboard’s ”enter” key to finish or confirm choices. The ”X” button is used to cancel or back out of a choice.

In the top-right corner of the LCD display there is a heartbeat indicator that should pulse every second. The LCD backlight will dim after a period of inactivity. The LCD backlight will flash when there is a problem reported.

Browse information about the Search Appliance from the main menu using the up and down arrow buttons. Press the “check” button at any time to return to the main menu. Available information:

- Link Speed and Duplex
• IP Config Type (Static or DHCP)
• Primary Ethernet MAC Address
• Current IP
• Current Gateway IP
• License Serial Number
• License Maintenance Expiration Date
• Current Hits per Day
• Current Documents in Database
• Current Searches per Minute
• Number of Running Crawls
• Number of Currently Connected Clients (web browsers)
• Current System Load Average for 1, 5, and 15 Minutes.
• Current Network Usage I/O Rates
• Current Memory Usage
• Current Swap Usage
• Current Disk Space Usage
• Current RAID Status
• Host and Domain Names
• Thunderstone Contact Information

From the main menu adjust configuration of the Search Appliance using the “check” button. Use up and down arrows to navigate through the choices. An asterisk, “*”, will appear at the end of items that have been modified but not applied. At the end of the config list are the options to apply or trash(discard) the changes. Available configs:

• IP configuration method
  DHCP or Static. Press ”check” or left or right arrow to change the value.

• IP Address
  Only used if IP method is Static. Press ”check” to change the IP. Use up and down arrows to change the digits of each number. Use the left and right arrows to move between digits. Use ”X” to cancel your changes. Use ”check” to keep your changes and move to the next config.

• Netmask
  Only used if IP method is Static. Edit the value as with IP Address.
2.1. HOW TO UNPACK AND INSTALL THE SEARCH APPLIANCE

- **Gateway**
  Only used if IP method is Static. Edit the value as with IP Address.

- **DNS 1**
  Primary Nameserver. Only used if IP method is Static. Edit the value as with IP Address.

- **DNS 2**
  Secondary Nameserver. Only used if IP method is Static. Edit the value as with IP Address.

- **Admin PIN**
  Set this to non-zero to require this password for making changes via the LCD front panel. Press "check" to change the PIN. Use up and down arrows to change the digits of each position. Use the left and right arrows to move between digits. Use "X" to cancel your changes. Use "check" to keep your changes and move to the next config.

- **Drop Firewall**
  Remove firewall restrictions etc. See same on console menu 2.1.1.

- **Drop Restre**
  Remove admin restrictions etc. See same on console menu 2.1.1.

- **Sys**
  Shutdown or reboot the system. Use "check" or left and right arrows to select the value. Use up or down arrows to move to another config.

- **Apply Now**
  Press "check" to apply changes. Select "No" or "Yes" to confirm then press "check".

- **Trash Changes**
  Press "check" to discard changes. Select "No" or "Yes" to confirm then press "check".

The LCD backlight and heartbeat are also configurable. From the main menu press "X" then "check" to escape to the "Options" menu. Use up and down arrows to select the item to adjust. Use "check" or left and right arrow buttons to cycle through choices. Changes to LCD settings are immediate. Press "X" twice to return to the main menu.

Under normal circumstances the LCD main menu will alternate between

<table>
<thead>
<tr>
<th>Thunderstone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search Appliance</td>
</tr>
</tbody>
</table>

and

<table>
<thead>
<tr>
<th>Up/Dn for info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check to config</td>
</tr>
</tbody>
</table>

If the display is not alternating or shows "Cli:0 Scr: 0" then the LCD menu is not functioning properly.
2.2 Customizing the Search Appliance’s Appearance

You may make common changes to the Search Appliance’s search appearance by using Search Settings from the administrative interface main menu. You may select color, font, size, result style and order, as well as setting boilerplate HTML to wrap around the search form and results.
Chapter 3

Operation

3.1 Running the Administrative Interface

The Search Appliance’s administrative interface is a web application that you access using your web browser. Access it using http://YOURSERVER/textis/dowalk where YOURSERVER is the name (or IP address) of your Search Appliance.

When you run the administrative interface you will be asked for the login and password. By default there is one login name. It is admin in all lowercase. If no other accounts have been added, you will not have to enter the name. It will be filled in for you. Your login will be remembered in a cookie until you logout. This way, you don’t need to enter the password every time you enter.

Note: If you share your computer with others, or it is available to people who should not be administering the Search Appliance, then you should logout when you are finished. This will help prevent unauthorized configuration.

The Search Appliance administrative interface uses JavaScript to enhance its functionality and make it easy to use, but the interface will also work well without JavaScript. No functionality of the Search Appliance will be lost if JavaScript is turned off in your browser (e.g. to prevent pop-ups on other sites). In this document, the user interface description assumes that JavaScript is enabled.

3.2 First Time Run: Quick Start

Step 1: Create an Account

A password was created by Thunderstone for the default administration account (admin), which you should now enter at the prompt. If for some reason this step did not happen, the first time you run the administrative interface you will be asked to create and enter a password. You should choose a password that is easy for you to remember but hard for someone else to guess, as this is an account that will control administrative access to the Search Appliance (additional accounts may be created later as needed). You will need to enter the same password twice (two input boxes will be provided) to help check for typing mistakes. Passwords are case sensitive. Once the password is created and Change is pressed, you will
automatically be logged in and taken to the Profiles page to create a profile.

Step 2: Create a Profile

A profile is a collection of data (URLs/documents) to be searched, plus the settings that control that search; a profile must be created and walked before searches can occur.

On the Profiles page, a profile may already have been created by Thunderstone if you requested it when ordering. If so, you may click on the profile name and proceed to the last step, searching. Otherwise, a default profile name and data directory will be filled in for you to create. You may change either of these if desired, then hit the Create Profile button.

A new profile will be created but a site walk/index will not be started yet. You are then presented with the main walk settings page. The Base URL will be automatically filled in with the name (or IP address) of your web server. If you wish to walk a different site you may change the Base URL at this point.

Step 3: Walk the Profile

Once you’re satisfied with the URL and extension settings, you may hit the GO or Update and GO button to begin a walk of your site. A walk will be started in the background and you will be taken to the Walk Status page. This page will show you the status of the walk in progress and indicate when the walk is complete. This page will automatically refresh every 10 seconds with the latest progress information until the walk is complete. When the walk is complete you will see a summary of errors.

Last Step: Search

Once the walk is complete, you may click Live Search on the menu at the top of the page. This will take you to the search that users will use. It is also the URL you can place on your web page(s) to send users to the search.

You now have a site index that you can use. There are many options to control the site walk as well as the search interface appearance. They are described in detail elsewhere in this manual. Use the All Walk Settings button on the administration script’s menu to see all of the options. Click the question mark (?) next to an item to get help for that item.
3.3 Administrative Interface Overview

The Search Appliance’s administrative menu has the structure given below. Each item is described on the pages that follow.

Entry
   Basic Walk Settings
   Update
   GO, Update and GO
   STOP
   All Walk Settings
   Update
   GO, Update and GO
   STOP
   Search Settings
   Update
   Profile Tools
   List/Edit URLs
   List Duplicates
   SOAP Tools
   Test Fetch
   Best Bet Groups
   Walk Status
   Refresh
   STOP Walk
   Query Log
   Test Search
   Live Search
   Profiles
   Create Profile
   Select a Profile
   Delete a Profile
   Accounts
   Add a User
   Change Password
   Delete
   User Groups
   Access Control
   Maintenance
   Documentation
   Appliance Home
   Logout
3.3.1 Entry

Upon entry to the Search Appliance’s administration interface you are prompted for user name and password. If you have logged in previously and still have the cookie and have not logged out, the login page is bypassed and you are taken directly to Profiles (see section 3.3.10, p. 18).

Your login is remembered in a cookie until you logout. This way you don’t need to enter the password every time you enter. If you share your computer or it is otherwise available to people who should not be administering the Search Appliance, you should logout when you are finished.

3.3.2 Basic Walk Settings

This is the central area for configuring a walk. The most commonly used walk related options and their settings are presented and they may be changed here. The Basic Walk Settings are a subset of the All Walk Settings. Next to each option is a question mark (?) which, if clicked, takes you to help for that option. The options are documented individually later in this manual in section 3.4.

At the bottom of the page is a set of three buttons. Pressing any of the buttons affects all options on the entire page.

- **Update**
  This button causes all changes on the form to be saved. No walk is started.
  If the **Rewalk Schedule** has been changed, the new schedule will go into effect immediately.
  If **Categories** have been changed, the walk database will be updated to reflect the new categories. The search interface will reflect the new categories.
  If **Single Page, Page File**, or **Page URL** has been changed, the listed individual pages will be fetched into the live search database and made available for searching.
  If the **Word Definition** or **Text Search Mode** is changed, the search index on the live database will be dropped and recreated. Searches might not work while the index is being rebuilt.

- **GO or Update and GO**
  The **GO** button will change to **Update and GO** after you make a change to any setting on the form. The ultimate behavior for either is the same.
  The current settings from the form will be saved as is done when you click **Update**. Then a new walk will be started. The new walk will be performed to either a temporary database or the live database, depending on the setting of Rewalk Type (Section 3.4.14). Then you will be shown the walk status page where you may monitor the progress of the walk.
  Changes to **Categories** or **Word Definition** will not be reflected until the walk finishes.

- **STOP**
  When a walk is in progress the **GO** button is replaced by the **STOP** button. This button terminates the running walk and abandon the work that it has done so far.

- **Reset**
  This button reverts all settings on the page to what they were when the page was first loaded.
3.3.3 All Walk Settings

This is the central area for configuring a walk. This is similar to Basic Walk Settings except that all walk related options and their settings are enumerated and may be changed here.

3.3.4 Search Settings

This page contains all of the settings related to the search interface that end users see when performing searches.

All search options and their settings are enumerated and may be changed here. Next to each option is a question mark (?) which, if clicked, opens help for that option. The options are documented individually later in this manual in section 3.6.

At the bottom of the page is a set of buttons. Pressing any of the buttons affects all options on the entire page.

- **Update Test**
  This button causes all changes on the form to be saved in the set of test settings, which can be tested via the Test Search link on the left side of the interface. It does not modify the Live Search settings.

  This allows you to “try out” settings before applying the changes to your live search users’ interface.

- **Update Live and Test**
  This button updates both the Live Search and Test Search settings. Use this either after testing out the settings via Update Test, or for small changes that you don’t feel the need to test out and immediately want to make live.

- **Copy Live to Test**
  If you try out changes via Test Search and you decide you don’t want them, you can use Copy Live to Test to discard the test changes you’ve made and revert back to the current Live Search settings.

- **Reset**
  This button reverts all settings on the page to what they were when the page was first loaded.

3.3.5 Profile Tools

The Profile Tools contain multiple tools for working with your profile.

**List/Edit URLs**

On this page, you may list or delete all or selected URLs from the database. You should always list before you delete, so you know that you are deleting the correct ones. While listing URLs, you may display all known information about a given page. You may also create categories for selected sets of URLs from this interface.
If a walk is in progress, delete is disabled and you are given the choice of listing URLs from the live search database or the new database being built by the walk.

Select List or Delete from the drop down list. The default is always List for safety.

In the pattern box, enter the URL or pattern for URLs for which you want information. This may be an exact URL or a wildcard pattern, which lists all URLs matching the wildcard pattern. For a wildcard pattern, use asterisk (*) to match anything and question mark (?) to match any single character. You may enter up to 10 different URLs or patterns in the box to find them all at once. Put a space between patterns when entering multiples. Leaving the pattern box blank implies *, and this will cause every URL in the database to be listed. Deletion will be denied if the pattern is blank or *.

Select the order in which you wish to see the list:
- **Depth**  
  URLs encountered first in the walk will be listed first
- **URL**  
  URLs are ordered alphabetically
- **Newest first**  
  URLs are ordered by modification date with newest ones first
- **Oldest first**  
  URLs are ordered by modification date with oldest ones first
- **Largest first**  
  URLs are ordered by download size with largest ones first
- **Smallest first**  
  URLs are ordered by download size with smallest ones first

Then Submit.

All matching URLs will be listed. Clicking on a listed URL opens a page of details about that URL. On that detail page, everything the database knows about that URL is presented. You can also see what pages refer to the selected page by clicking Parents and what pages the selected page refers to by clicking Children. The test link next to the URL can be used to do a live test fetch of the page to find out how the Search Appliance processes it. See Maintenance->Test Network and Servers 3.11.4.

If your pattern matches less than the entire database, you will be given a form from which you can create a category using the same pattern(s). Simply enter the name of the category to create and click Submit. The name is the name that users will see on the search form. This new category will also appear on the main settings page along with the other categories. It will also be immediately available to search users.

If the profile is a meta search, then the profile has no URLs of its own to list. The List/Edit URLs page will instead display links to the list/edit URL pages for each of its target profiles.

**Live Search and New Walking Database**

These options are presented on the List/Edit URLs page (see 3.3.5) if a walk is active. They allow you to choose which database to query. The “Live” database is the one from a previous successful walk that is what search users see. The “New” database is the database currently being built by the new walk. It is not visible to search users.

**List Duplicates**

This section allows you to list all the duplicates of a given page. The URL entered may be the URL that was kept in the walk, or any of the pages that were excluded as a duplicate of pages already in the walk.

If Keep Refs was used in the walk, then all the pages that linked to the duplicate pages will also be listed.
Test Fetch

Test how the Search Appliance will handle specific URLs. See Maintenance -> Test Network and Servers, p. 100.

Results Caching

The Results Caching profile tool allows management of the results cache for the profile. If enabled (p. 79), the results cache can improve search response time by caching frequently used search results: if a later query is made with the same query string parameters, it may be found in the cache, thereby saving the time needed to run the query again.

On the Results Caching profile tool page, the status of the cache manager is reported (whether it is running, and what process ID). The cache manager runs in the background, deleting old entries and refreshing the cache if requested. The size of the cache table (if it exists) is also shown, both number of entries and size in bytes. Old entries are deleted as per the current Results Caching settings (p. 79).

Several actions can be performed on the cache, if results caching is enabled:

- **Clear** - Clears the results cache table. All previously cached results will be removed. This can also be used to free up disk space if needed.
- **Start Refreshing** - Mark all entries for refresh. The cache manager will then start refreshing the cache in the background, starting with the highest-priority entries: queries will be re-executed to ensure the cache entries reflect the latest crawl data. This can increase load on the machine, as the cache manager will now be executing queries (though only serially, one at a time). Existing cache entries marked for refresh – but not yet actually refreshed – are still otherwise valid, i.e. they may still be used to resolve user searches.
- **Stop Refreshing** - Mark all entries as not needing refresh. This will stop the cache manager from executing queries to refresh the cache, and thus may reduce machine load. The manager will still continue to run to expire old entries, etc.
- **Import** - Import cache queries (without results data) from another profile, and mark for refresh. This will copy the results cache from another profile, but since each profile’s crawl data is different, the actual search results will not be copied, as they would be invalid. Thus, the entries will not have search data (and cannot service requests), but will be marked for refresh by the cache manager. This option can be used to “prime the pump” when creating a new profile to replace an existing live profile as the default: the existing profile’s queries can be copied over and refreshed. When the refresh is complete (indicated by “no entries marked for refresh”), the new profile can be made live, and will already have a largely up-to-date cache.

Caveats: As results caching currently only takes into account the query string to differentiate requests, it should not be enabled under results authorization or other scenarios that utilize additional data (such as cookies or request headers) for search requests. The results cache is stored in the same database as the profile crawl data, so it is deleted and started anew for each New type crawl – just as the crawl data its results are based on starts anew with New type crawls. If a Refresh crawl is done that significantly changes
the crawl, the cache should probably be cleared to avoid stale or out-of-date results; alternatively, the Max Cache Entry Age setting might be decreased.

**Best Bet Groups**

The Best Bets are grouped together. This allows different groups to be shown in different places, and easily rotated in or out. For example, you might have one group of links that you have determined to be the most probable results for a user’s query, and another group that includes links you want to promote.

The Group Name is how the group will be identified elsewhere in the administrative interface. This should be chosen to readily remind you of the purpose behind the group.

The Result Type indicates which fields will be shown on the results page. The title and description are entered by the administrator, rather than always being taken from the page.

### 3.3.6 Walk Status

This page shows the status of the latest walk for the current profile. If a walk is in progress, it is the one reported.

During an active walk, it indicates a summary of how many pages are to be walked in the next hour, how many were walked in the last hour, and the total number of pages. There is a list of the most-recent URLs fetched, with number of errors and duplicates found, followed by a list of the next URLs to be walked. Below that is summary information about the walk itself, including walk start time, starting URLs, and some profile settings. The Walk Status page updates automatically every 10 seconds until the walk is complete or another page is selected. (After 10 minutes of user inactivity it will refresh once a minute to save traffic.)

When no walk is in progress, the report also includes a list of errors and duplicates encountered. If the last walk was abandoned, the report includes information about how far it went, as well as the report from the last complete walk.

**Now button**

During the walk the *Refresh display: Now* button may be selected to force a Walk Status display refresh before the 10 second automatic refresh. Note that this only affects the display, not the walk itself.

**Pause/Auto button**

The *Refresh display: Pause* button pauses the Walk Status display (prevent the browser from refreshing the display every 10 seconds): this changes the button to *Auto* which will have the opposite effect (resume the auto-refresh). This is useful when examining the status page in detail, and avoiding being interrupted by the browser auto-refresh. Note that both buttons only affect the display, not the walk itself.
STOP walk button

The **Current run:** STOP walk button on the Walk Status page stops the current walk. If the walk type is **New**, the walk will be abandoned (current live search is left intact and not updated). If the walk type is **Refresh**, the new pages are always live (since refresh uses one database), but the search indexes are not updated.

Pause walk and Make live button

The **Current run:** Pause walk and Make live button pauses the current walk, updates its search indexes for speed, and makes the walk live (i.e. deletes the current live database and replaces it with the current walk). This can be useful if you ran out of disk space while indexing and subsequently freed up some space, or if a long running walk was stopped and you want to use the incomplete walk. If the walk was abandoned due to an error, make sure you resolve the problem before trying to make the new database live.

3.3.7 Query Log

The query log pages provide detailed and summary information about queries. Query logging must be turned on to generate information on the query log pages. If query logging has never been turned on for the current profile, there will be nothing to see. The query log is erased each time the database is rewalked.

The pages are as follows:

- Query Report
- Top Query Words
- Top Queries
- No Hits
- Best Bet Clicks

The query log lists the time that each search occurred, the IP address of the web user performing the search, the number of hits for the search, and the user’s query. For URL clickovers, it displays the query instead of the number of hits and the actual URL instead of the query.

Selecting the Date/Time for a listed query will display a page with complete information about the search. This page includes everything from the summary list, and any non-default parameter settings from the search. A hyperlink is provided so that you may perform the same query as the user.

3.3.8 Test Search

This hyperlink opens the search interface. It forces the interface to use the search settings listed on the Search Settings page, whether they have been applied or not. This allows you to test search settings without affecting end users until you are satisfied with the new settings.
This mode also places two extra hyperlinks at the top of the search pages. Back to Administration allows you to return to the Search Appliance administration interface. Make this appearance live does that too, but it additionally makes the search settings you are testing “live”, so that end users also see the search setting effects.

### 3.3.9 Live Search

This hyperlink opens the Search Appliance search interface as end users see it.

### 3.3.10 Profiles

This page presents a list of existing profiles. A profile contains the walk and search settings for a collection of pages. The profiles are listed in the order of creation by default; clicking on Name will re-order by profile name. You can click on a profile’s name to see and/or change its settings and status or to start a walk.

You can click on Delete next to a profile to delete that profile. You will be asked whether you really want to delete the profile or not.

When a profile is deleted, all of its settings are lost and any walk database it has created is deleted. There is no way to get back any of these items after the profile is deleted. You should not delete a database that is being actively searched.

You may also create a new profile by entering a new name.

You can copy settings from an existing profile to your new profile by selecting its name from the drop down list. This allows you to set up another site similar to an existing one. It allows you to experiment with the walk settings for an existing site, without potentially harming the good walk that is being searched by your users.

### 3.3.11 Accounts

This section provides information to maintain multiple login accounts for access to the Search Appliance administration. All users are listed on this page. You may add users, delete users, and change individual user passwords. The default user, called admin, may not be deleted.

The Accounts page also allows you to create multiple administrative users. There is no distinction among them after they are created. All users have full administrative permissions, and they may create and delete any user or change any user’s password. This is a basic security mechanism meant to keep unauthorized persons from using the web based administrative interface. The purpose of supporting multiple administrative users is that you can create distinct passwords, which you can revoke in the future without needing to change a single global password that all administrators know.

The passwords are one-way (forward) encrypted. This means that a forgotten password may not be discovered. The only way to deal with a forgotten password is to change the password.
Add a User

To add an administrative user, enter the new user’s login name and password. You will need to enter the new password a second time into the Confirm box to protect against typing mistakes (since you can’t see the password you are typing).

Names and passwords are case sensitive. “Joe” is different than “joe”. You should choose passwords that are easy to remember, but difficult for someone else to guess.

Change Password

Here you may change the password for the selected user. You will need to enter the new password twice to protect against typing mistakes (since you can’t see the password you are typing). Enter the password once the Password box and again into the Confirm box

Passwords are case sensitive. “Joe” is different than “joe”. You should choose passwords that are easy to remember, but difficult for someone else to guess.

Delete

This will delete the selected user. You will be prompted to confirm whether the user should really be deleted or not. Once a user is deleted, there is no way to get it back except to re-add it.

The default user, “admin”, may not be deleted.

3.3.12 User Groups

User groups may be created on this page, by clicking the Add a Group link. Existing groups may be edited or deleted with the appropriate links. User groups are used to associate administrative users into similar-privilege groups for easier access control maintenance. See the User Groups section for more details (p. 83).

3.3.13 Access Control

The Access Control page allows configuration of administrative users’ access to administrative actions (creating profiles, starting walks etc.). In conjunction with user groups, access control can be used to restrict certain users to only certain actions, instead of allowing all users access to all administrative functions. See the Access Control section for more details (p. 83).

3.3.14 Maintenance

The Maintenance page contains various links for maintaining and editing operating-system and overall settings.
See also Maintenance 3.11.

3.3.15 Documentation

This provides a hyperlink to the online version of this document.

3.3.16 Appliance Home

This provides a hyperlink to the online home of the Search Appliance.

http://www.thunderstone.com/texis/site/pages/Appliance.html

3.3.17 Logout

This will log you out of the administrative interface and clear your login cookie. It then takes you back to the login page.

3.4 Basic Walk Settings

This page contains the settings that are used most commonly. They are available in Basic Walk Settings.

The settings on the Basic Walk Settings page are a subset of the settings on the All Settings page. Use the page that is most convenient for your current task.

3.4.1 Walk Summary

This is informational only. It contains summary information about the most recent walk and recategorizations. The information includes the date and time of the walk, whether the walk was successful, how many pages were indexed, and the number of duplicate pages.

3.4.2 Notes

This is a scratch pad area for the administrator of the profile. It in no way affects the walk or search.

3.4.3 Base URL

Syntax: one or more URLs, one per line

This is the address where the web crawler will start walking your site. If the whole site is to be searched, simply enter your web address, for example “http://www.mysite.com”. If the search is to be limited,
3.4. **BASIC WALK SETTINGS**

specify the address to start the search or create a page listing the URLs to search. The search will only return information from your web site - no off-site searching will be done. Directory URLs should include a final forward slash “/”. Example - “http://www.somehost.com/mysite/”. If you have a virtual domain that just redirects to another URL, enter the destination URL as your Base URL instead of your virtual domain name.

You may specify multiple base URLs to index multiple sites; the Search Appliance’s idea of a “site” is a single host as identified by the hostname portion of a URL. Therefore http://www.mysite.com, http://www2.mysite.com, and http://mysite.com would all be considered different sites.

In version 4.02.1046373961 Feb 27 2003 and later, the special “protocol” http-post or https-post may be used for a Base URL. This uses the POST method instead of the GET method to fetch the URL, using the query string as POST data (it must be URL-encoded). This can be used to start walking at a login page form that requires POST instead of GET. Note that the URL stored in the html table will have the -post and query string removed for security. During a Refresh walk, when a URL is about to be refreshed, the probable Base URL that led to it (i.e. the one with the longest prefix) will also be fetched. This helps ensure that login cookies are properly restored to allow the Search Appliance access during the refresh. Example:


In version 5, a username and password may be given in the Base URL. Normally, if only one login is required to access the site to be walked, the username and password should be given in the Login Info walk setting. However, if several different logins are required, the additional logins can be specified as user:password@ prefixed to the hostname in the Base URL. Note that the user/pass is for WWW Basic Authentication. If your site uses a custom or form-based login, use http-post instead. Example:

“http://MyName:MyPassword@www.myhost.com/login.asp”

See also URL file 3.5.7, URL URL 3.5.8, Single page 3.5.9, Page file 3.5.10, and Page URL 3.5.11 for more ways to specify URLs.

### 3.4.4 Enterprise

Syntax: a single domain name

The name of your company’s domain. This is useful if your company’s web presence consists of multiple hosts within its domain, and you want them all indexed together as a unit.

This allows you to walk any URLs encountered during the walk of the base site(s) that are within the given domain. The Search Appliance will attempt to guess this value for you, but you may set it to whatever you wish. Check the Yes box to enable this feature.

See also Extra domains 3.5.14 which is the same but allows more than one domain. These options may be used together.

### 3.4.5 Robots

Syntax: select Yes or No buttons
robots.txt
With this set to Yes, the Search Appliance will initially get /robots.txt from any site being indexed and respect its settings for what prefixes to ignore. Ignoring robots.txt is not generally recommended.
See also Robots.txt 4.5.

Meta
Respect the meta tag called robots. With this set to Yes the Search Appliance will process and respect the robot control information within each retrieved HTML page.
See also Robots.txt 4.5.

3.4.6 Allow Extensions

Syntax: one or more file extensions separated by space
A list of the URL extensions that the crawler will accept. The default list is empty, i.e. all extensions are allowed.

To search MS-Word documents, use .doc. For Shockwave/Flash use .swf. For WordPerfect documents specify whatever extension you use and ensure that the web server returns the MIME type application/wordperfect as there is no consistent extension for WordPerfect documents. Any extensions not listed here will not be searched or walked.

A few other extensions you may find useful are

.asp
.cfm
.jsp
.shtml
.jhtml
.phtml

3.4.7 All Extensions

Syntax: select Yes or No button
Retrieve all files instead of only those listed in Allow Extensions. This turns off checking of URL extensions. All URLs will be retrieved regardless of the extension (including images and such files).

3.4.8 Exclude Extensions

Syntax: list of extensions
A list of URL extensions that the crawler will reject. The default is empty, i.e. no extensions will be rejected.
3.4.9 Exclusions

Syntax: zero or more strings, each on a separate line

Excludes URLs containing any of the specified literal strings anywhere in the URL (hostname, path, or query).

See also Exclusion REX 3.5.17 and Exclusion prefix 3.5.18 for more ways to exclude URLs.

3.4.10 Crawl Delay

Syntax: a decimal number from 0 to 10

Causes the Search Appliance to wait the specified number of seconds between page fetches. Normally set this to 0, and the Search Appliance will fetch and process pages as quickly as it can. Increase the Crawl Delay if the web server cannot handle being hit rapidly. Increasing this value forces the walk to take at least the following number of seconds to complete: the Crawl Delay number times the number of pages on the site.

Decimal numbers may be specified - 0.1 will cause it to walk no more than 10 pages per second, etc.

Note: Using a delay larger than 0 forces Threads(3.4.11) to 1. A delay defeats the advantage of multiple threads and large delays could cause unexpected page fetch timeouts.

3.4.11 Parallelism

Syntax: whole numbers from 1 up

**Threads**

This is the maximum number of simultaneous page fetching threads to allow against each site. Setting Threads higher than 5 is probably not very helpful, unless you have many “Single Pages” that are on various hosts.

**Servers**

This is the maximum number of different web servers to walk simultaneously. Setting this too high can stress your memory, cpu, and network.

3.4.12 Verbosity

Syntax: whole number from 0 through 4

Sets how much information the walker should provide about what it’s doing. The default verbosity level is 2. The values are described in the following table.

The levels are cumulative. In other words, each level includes the previous levels.

Warning: at Verbosity 4, full Primer URLs will be printed to the Walk Status Log. If you use Primer URLs
Table 3.1: Verbosity Levels

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Issue no messages except errors</td>
</tr>
<tr>
<td>1</td>
<td>Display starting point URLs</td>
</tr>
<tr>
<td>2</td>
<td>Display selected setting info</td>
</tr>
<tr>
<td>3</td>
<td>List URLs found in URL files</td>
</tr>
<tr>
<td>4</td>
<td>Indicate why URLs are rejected</td>
</tr>
</tbody>
</table>

that contain credentials that you don’t want other the Search Appliance administrators to see, you will need to restrict access to the Walk Status, in addition to the Primer URL, when using Verbosity 4.

### 3.4.13 Disable Walks

When set to Y, no walk will launch for this profile for any reason (manually run, schedule, etc). Note that even if set to N, walks may still be globally disabled if the System Wide Setting Disable All Walks is set.

This can be useful with machines that should be dataload-only, or for machines that want to guarantee their content won’t change.

### 3.4.14 Rewalk Type

**Syntax:** select from drop down box

This determines how rewalks are performed.

**New**

The type New creates a new database and does a complete walk of everything, starting with the Base URLs. A New walk does not disturb the existing database.

**Refresh**

The default rewalk type Refresh updates the existing database, and only downloads files that have been modified or created since the last walk. Pages that are no longer present on the server are removed from the database.

Here are other considerations for using Refresh. Pages that were referenced but were missing in the initial walk (the walk prior to the Refresh), but were added after the initial walk, will be missed by Refresh if their parent page has not been modified. If you change your settings to be more inclusive (ie add extensions, ignore robots, add domains, etc.), you should do a New walk once, because a Refresh is not likely to find the newly allowed data, unless all of the pages leading to this data have been modified.
If more than 30%-50% of your site changes between walks you may be better off using a *New* walk instead of *Refresh*. Also, many dynamic content generators do not give modified dates which will cause every page to be rewalked. In that case you should use *New* instead of *Refresh*.

**Refresh in version 5 vs. 4**

In the Search Appliance version 4 and earlier, the refresh walk checked every page in the database to determine whether it needed updating. Since only changed pages need updating, and those are typically a small percentage of the site, checking for changed pages is faster than doing a complete new walk. However, it is still time-consuming, because the web server must be accessed for every page on the site, and only the web server can inform the Search Appliance whether the page has changed.

In the Search Appliance version 5 and later, there is an improved refresh process. The walk is adapted to focus on the small but important group of changing pages. As each page is walked, a refresh period is calculated for that individual page. The calculation is based on whether the page has changed since the last time it was fetched, and how long ago that fetch was. This refresh information is used to determine when the page should be checked again. In this way, the walk prioritizes the walking of pages that change often or are new, and it delays the fetch of pages that seldom change.

Thus, when a walk (scheduled or manual) takes place, only the pages that need to be refreshed now are actually fetched – not the entire database. The result is a database that is updated by a process that consumes fewer server resources.

**Rewalk Type Summary Table**

The following table summarizes the trade-offs for the new and refresh rewalk types.

<table>
<thead>
<tr>
<th>Method</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New</strong></td>
<td>Guarantees most accurate representation of current site. Does not disturb live search database.</td>
<td>Uses more bandwidth and temporary disk space. Longer time before site changes are reflected in live search.</td>
</tr>
<tr>
<td><strong>Refresh</strong></td>
<td>Faster. Uses less bandwidth and temporary disk space. Site changes are reflected in live search much sooner.</td>
<td>Could get out of sync with actual site under rare circumstances. A lot of changed pages could substantially slow searches during the walk. Requires If-Modified-Since support on walked web server.</td>
</tr>
</tbody>
</table>

**3.4.15 Rewalk Schedule**

Syntax: select from drop down boxes

This performs a rewalk on the schedule specified. The rewalk action is the same as the one that can be started manually by clicking the *GO* button. The *Frequency* defines how often to automatically rewalk. The *Hour* defines which hour to start the rewalk for daily or weekly runs.
You can define multiple walk schedules for the same profile by clicking the Add More Schedules link. This gives you more granular control in setting schedules. For example, instead of choosing between once a day and once an hour, you can have a crawl launch 3 times a day by making the 3 schedules

- Daily at 8AM
- Daily at 12PM
- Daily at 4PM

To remove a schedule, set its Frequency to -None-.

See also Notify 3.5.2. If you are using “On Change” see also Watch URL 3.5.1.

### 3.4.16 Action Buttons

These buttons tell the Search Appliance to do something now. Only the buttons applicable to the current status are displayed. The buttons are as follows:

- **Update:** Save the current settings for future use but don’t begin a walk.
- **GO:** Begin a walk using the current settings.
- **Update and GO:** Save the current settings then begin a walk using those settings.
- **STOP:** Stop and abandon the walk that is currently running.

See the Walk Settings section (3.3.2) for details about the operation of these buttons.

### 3.5 Advanced Walk Settings

These are the advanced settings that are used less commonly than the settings available in Basic Settings. The advanced settings are available in All Walk Settings.

#### 3.5.1 Watch URL

**Syntax:** an HTTP URL

The URL specified here will be refreshed every time that The Search Appliance starts a refresh walk. This can be used if you have a page that lists new documents that are added to the site as it will ensure that the links are found as soon as possible.

#### 3.5.2 Notify

**Syntax:** an email address

If this is set, a summary report will be sent to the supplied email address when a scheduled rewalk occurs.
3.5. ATTACHED WALK SETTINGS

3.5.3 Attach Logs

This selects the log files to attach to the walk notification. The log files and walk errors are for the period of
the refresh walk, and are sent as tab separated files that can be opened with programs such as Excel for
further processing.

If the query log is attached it will be cleared after being emailed. This is an alternative to separate query log
rotation and emailing and is particularly useful when using mode new for rewalks and you don’t want to
lose the query log. See also Rotate Schedule (section 3.6.3).

3.5.4 Categories

Syntax: textual name and URL pattern pairs, additional input boxes will appear as you fill the ones provided
The Search Appliance can create searchable sub-categories that will appear in a drop down box on the
Search page. Enter the name of the category on the left, and its corresponding URL pattern on the right.
URL patterns may contain asterisk(*) to indicate “anything” and question mark(?) to indicate any single
character. There may be more than one pattern for each category. Separate multiple patterns with space.
The following table provides an example.

<table>
<thead>
<tr>
<th>Category</th>
<th>URL Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrations</td>
<td><a href="http://SERVER/demos/">http://SERVER/demos/</a>*</td>
</tr>
<tr>
<td>Manuals</td>
<td><a href="http://SERVER/manual/">http://SERVER/manual/</a>*</td>
</tr>
<tr>
<td>Books</td>
<td><a href="http://SERVER/a1/">http://SERVER/a1/</a>* <a href="http://SERVER/b3/">http://SERVER/b3/</a>*</td>
</tr>
</tbody>
</table>

This example would create a category named “Demonstrations” which would only search the URL
“http://www.mysite.com/demos/” and any files under this directory, thereby creating a more
concise match to the user’s search. The same is true for “Manuals”. However, the “Books” category
would include pages from both the “a1” and “b3” directories. The user would now have the option to
search within just these categories or the entire database. The pattern should not be a single page unless you
want a category with a single page in it (e.g. “http://www.mysite.com/manual/index.html”
would be incorrect). It should typically be a prefix for a directory that has multiple pages within it followed
by an asterisk (*).

For best search performance, categories that overlap one another – i.e. contain pages in common – should
be listed most-commonly-searched first.

3.5.5 Categories Type

Syntax: radio button choice

The Categories Type setting sets what type of categories are being used, and how to optimize category
searches. It set to one of:

- Auto-detect
Automatically detect what kind of category is being used on a per-category basis, and optimize searches accordingly. This lets non-overlapping categories (i.e. those whose pages do not occur in any other category) be searched fastest, while still supporting overlapping categories as fast as possible. This is the default mode.

- Overlapping
  Assume that any category might overlap another. Category searches will be slower than with the other modes. This mode was used before the Categories Type setting existed. It can be set as a fallback if the cached overlap data is believed to be incorrect for some reason, e.g. category searches are wrong.

- Non-overlapping
  Assume that no category overlaps another. All category searches will be as fast as the fastest Auto-detect mode search, but searches for overlapping categories may not show all results. This mode can be set to force higher-performance searches at the potential expense of accuracy.

For best search performance, categories that overlap one another – i.e. contain pages in common – should be listed most-commonly-searched first in the Categories setting list. Also, the CatnoLowest field should be selected as one of the Compound Index Fields (p. 44. These guidelines will allow the Auto-detect mode to optimize the most searches to the fastest possible speed.

### 3.5.6 DBWalker

Here you can select one more more database walking configurations to include in this profile. This can be done in addition to specifying any Base URLs (section 3.4.3). To select multiple configurations, hold Ctrl while clicking in the select box.

For more information on the database walker module, please see the DBWalker section (4.21, pg. 131) of the manual.

### 3.5.7 URL File

Syntax: the full path to a file on the web server’s disk

This allows you to specify a file containing a list of site URLs to walk. This is an additional way of specifying more Base URLs 3.4.3. This file will be reread each time a rewalk is started. In the file, the list of URLs can be one URL per line (preferred) or delimited by any number of spaces.

### 3.5.8 URL URL

Syntax: an HTTP URL to a plain text file (not HTML)

This allows you to specify the URL of a plain text file containing a list of site URLs to walk. This is an additional way of specifying more Base URLs 3.4.3. This URL will be refetched each time a rewalk is started. In the file, the list of URLs can be one URL per line (preferred) or delimited by any number of spaces.
Warning: Due to the nature of Stay Under, a large number of URL URLs (1000+) in different directories will cause the crawl to progress very slowly, as all URLs encountered will need to be checked against every one of those directories. In such a situation, we recommend turning off Stay Under and instead writing your own Required Prefix/Required REX expressions, which will be more efficient.

3.5.9 Single Page

Syntax: one or more HTTP URLs, one per line

Here you may specify URLs for individual pages to include in the index. These pages are fetched and stored in the database like others but the hyperlinks on them are not followed during a walk.

If you change this and click “Update” instead of “GO” the added pages will be fetched immediately and added to the existing database. Pages removed from the list will NOT be removed from the database until the next rewalk.

3.5.10 Page File

Syntax: the full path to a file on the web server’s disk

This may be used to specify a file containing URLs for individual pages.

If you change this and click “Update” instead of “GO” the added pages will be fetched immediately and added to the existing database. The file itself is not checked for changes, and pages removed from the file will NOT be removed from the database until the next rewalk. In the file, the list of URLs can be one URL per line (preferred) or delimited by any number of spaces.

See also Single page 3.5.9.

3.5.11 Page URL

Syntax: an HTTP URL to a plain text file (not HTML)

This may be used to specify the URL for a plain text file containing URLs for individual pages. In the file, the list of URLs can be one URL per line (preferred) or delimited by any number of spaces.

If you change this and click “Update” instead of “GO” the added pages will be fetched immediately and added to the existing database. The file itself is not checked for changes, and pages removed from the file will NOT be removed from the database until the next rewalk.

See also Single page 3.5.9.

3.5.12 Strip Queries

Syntax: select Yes or No button

Strip query strings from all URLs. Some URLs have query strings on the end indicated by a question mark.
With this option set to Yes, all query strings are removed from URLs before they are processed or retrieved.

### 3.5.13 Ignore Case

**Syntax:** select Yes or No button

This tells the Search Appliance whether to ignore case in URLs or not. The case of hostnames is always ignored but the case of paths and filenames is respected. Some web servers don’t respect case and people use various random capitalizations within filenames making the same file look like different URLs.

### 3.5.14 Extra Domains

**Syntax:** one or more domain names separated by space or line break

Allow walk to fetch pages from any host in the specified domain(s). Any URL with a hostname ending in any of the specified domains will be accepted.

*e.g.*: Given a base URL of http://www.mysite.com/ and extra domain othersite.com the Search Appliance will walk all of www.mysite.com and any URLs referring to any machine in othersite.com.

This option is not a “restricter” but an “enabler”. All hosts specified will be walked and any others that match the given domain(s) will also be walked.

**Note:** This option does NOT direct the walk to completely index every web server in the specified domain. It simply allows walking them if a reference to them is encountered.

### 3.5.15 Extra Networks

**Syntax:** one or more IP address prefixes separated by space or line break

Allow walk to fetch pages from any host within the network specified by the numeric IP address(es).

*e.g.*: Given a base URL of http://www.mysite.com/ and extra network 192.0.2 the Search Appliance will walk all of www.mysite.com and any URLs referring to any machine having an IP address prefix matching 192.0.2.

**Note:** This option does NOT direct the walk to completely index every web server in the specified network. It simply allows walking them if a reference to them is encountered.

**Note:** Using this option has the potential to slow the walk, because every URL’s hostname must be looked up. If there are many different off-site hosts, or your DNS is slow, the walk may be slowed substantially.

### 3.5.16 Extra URLs REX

**Syntax:** zero or more regular expressions (REX), separated by space or line break
3.5. ADVANCED WALK SETTINGS

Restricts walks to fetch URLs only matching any of the specified regular expressions anywhere in the URL (hostname, path, or query) when the Base URL matches.

If a Base URL is matched by an Extra URLs REX, then the only URLs that match the Extra URLs REX will be crawled on that host. If a Base URL does not match an Extra URLs REX, then it is walked as normal.

It is a rarely used setting, most commonly used in conjunction with a hostname to fetch matching URLs on an additional host. Links still need to be found to those pages for them to be indexed.

For example, with the following Extra URLs REX:

```
>>=http://products\.mysite\..com=!supplierid+supplierid\=BigCo
```

(which matches a URL that begins with `products.mysite.com` and contains `supplierid=BigCo`), and using the following Base URLs:

```
http://products.mysite.com/listProducts.aspx?supplierid=BigCo
```

The Extra URLs REX matches the `products.mysite.com` URL, so only pages with `supplier=BigCo` will be walked, while all of `help.mysite.com` will be walked (following other inclusion/exclusion rules).

Available from version 4.3.9.

See also Extra Domains, p. 30.

### 3.5.17 Exclusion REX

Syntax: zero or more regular expressions (REX), each on a separate line

Excludes URLs matching any of the specified regular expressions anywhere in the URL (hostname, path, or query).

<table>
<thead>
<tr>
<th>REX</th>
<th>Matches</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>/scratch[0-9]/</code></td>
<td>a subdirectory named <code>scratch</code> followed by a single digit</td>
</tr>
<tr>
<td><code>[^\alnum]test[^\alnum]</code></td>
<td>the word <code>test</code> (but not <code>retest</code> or <code>tester</code> etc.)</td>
</tr>
</tbody>
</table>

See also Exclusions 3.4.9, Exclusion prefix 3.5.18 and Exclude by Field 3.5.19.

### 3.5.18 Exclusion Prefix

Syntax: zero or more URL prefixes, each on a separate line

Excludes URLs beginning with any of the specified prefixes. The entire URL (hostname, path, and query) is used for comparison.
Examples:

http://www.mysite.com/scratch0/
http://www.mysite.com/scratch1/
http://www.mysite.com/books/t

See also Exclusions 3.4.9, Exclusion REX 3.5.17 and Exclude by Field 3.5.19.

3.5.19 Exclude by Field

Syntax: Metamorph query, field to search, what to exclude

This provides more flexible control of what to exclude and how to exclude it. One exclusion per row of controls may be entered; new blank rows will be provided as rows are used. The Metamorph Query column is where a Metamorph query (i.e. a typical search on the Search Appliance) is entered: e.g. several keywords or a regular expression. The Field and Meta Field columns determine what the Metamorph Query searches: if Meta Field is non-blank, that named meta field is searched, otherwise the field selected in Field is searched. The Exclude column controls the action for pages that match the query: Pages and links indicates that both the matching page and its links are to be excluded; Pages only indicates that the matching page is to be excluded but its links are still followed – this is useful for excluding navigation-only pages; Links only indicates that the page is still included but its links are excluded.

See also Exclusions 3.4.9 and Exclusion REX 3.5.17.

3.5.20 Additional Fields

Syntax: Name, Type, Searchable, Sortable, Output

The additional fields allow you to add up to three additional fields to the index. These fields can be included in the output if you use the XSL or XML output, sorted on, and searched on. They are populated with the Data from Field (p. 33) settings.

Name - specifies the name of the additional field. It also specifies element that will hold the field contents if it is output in XML. The name must be a valid XML element name (may contain only alnum or _ and must start with a letter or _).

Type - specifies the internal storage type for the additional field. Anything can be stored as Text, but if you want to do numeric or date comparisons (such as sorting), you have to use an appropriate data type.

Searchable - specifies whether this additional field is directly searchable. This is done with an additional URL parameter that is separate from the normal query. Please see the Additional Fields section of Procedures and Examples, p. 130, for more details.

Sortable - specifies whether you allow sorting by this additional field. This is done with the order search parameter. Please see the Additional Fields section of Procedures and Examples, p. 130, for more details.
Output - specifies whether this field should be included with the output for XML results. Note that this ONLY refers to XML output, none of the ‘stock’ result styles will include additional fields. If you want an additional field to show up in your search results, you must set Output to Y for the field, use XSL Stylesheet result style, and customize the stylesheet to display the element for the Additional Field.

3.5.21 Data from Field

Syntax: REX expression, Replace expression, field to search, where to store it

This provides alternate means of setting both the HTML fields (Modify Date, Title, Description) and any Additional Fields. It allows getting page information from non-default places by searching and optionally replacing the data. New blank rows will be provided as rows are used. See below for examples.

REX Search - Allows you to specify a REX expression to narrow down what contents of the From Field will be used. Leave it empty to use the entire field.

Note that a REX Search must be specified for the following From field types:

- HTML
- Text

You can specify they entire field for these by using .* as the REX Search.

Replace - Replace can be used to specify a subset of the value to be stored in the To field (or subset of the match, if you’re using REX Search. It uses sandr replacement string syntax.

From Field - specifies what the source field is for the data.

- HTML - the raw HTML source of the page.
- Text - the text of the page, after HTML rendering has been applied.
- Title - the HTML title of the page
- All Meta - the contents of all meta headers specified in the HTML page.
- Meta Field -> - the contents of a specific meta field, specified in the next input box, From Meta Field.
- Keywords - the contents of the keywords meta header.
- Description - the contents of the description meta header.
- Mime Type - the MIME type of the page. This may have been derived from the Content-Type header, a <META HTTP-EQUIV> tag, or the URL extension, depending on what is available.
- URL - the URL of the page.
• URL Decoded - the decoded version of the URL. Any `%XX` 'URL-safe' sequences in the URL are replaced with their real characters. E.g. Pre%20%2D%20Expense%20Report.doc is decoded into Pre - Expense Report.doc.

• URL Protocol - the URL's protocol, e.g. http.

• URL Host - the host (without port number) from the URL.

• URL Host and Port - the host (and port number if given) from the URL.

• URL Path - the file path from the URL.

• URL Path Decoded - the file path from the URL, URL-decoded.

• URL Anchor - the anchor from the URL (if any), i.e. the part after the # (pound sign). May not be available if already stripped.

• URL Query - the query string from the URL (if any), i.e. the part after the ? (question mark).

• URL Query Var -> - the value of the URL query-string variable named in From Meta Field, URL-decoded.

From Meta Field - If Meta Field -> or URL Query Var -> is given as the From Field, this field is used to specify which meta field’s or query var’s contents to use as data. Leave blank otherwise.

Entering text in this field will force the use of Meta Field ->, regardless of the From Field setting.

To Field - specifies where information should be stored. Modified Date, Title, and 'verb'Description' are the standard HTML fields. If you’ve defined any Additional Fields, they will also be listed as selections here.

If you just added an Additional Field, you will need to hit Update for the Additional Field to appear in the To Field list.

Subfetches

One of the Data From Field targets is Subfetch. This causes the Search Appliance to take the value it finds, and performs a fetch of that URL. Nothing is changed by the subfetch, but any further Data From Field rules will use that fetched document as the source of its content. Please see the Subfetch example below for a situation where this could be used.

Data From Field Example - Using Description for Title

If there’s a site that uses the same HTML title for every page but has a nice description, you can use the following settings to store the description in the title field (in addition to the description field).

REX Search - (Empty)
Replace - (Empty)
From Field - Description
From Meta Field - (Empty)
To Field - Title
3.5. **ADVANCED WALK SETTINGS**

**Data From Field Example - using PublishDate for Modified Date**

If you’re crawling a site of articles that specify a `PublishDate` meta field for every page, you can use that field’s value instead of the normal Modified Date. **REX Search** - (Empty)

Replace - (Empty)
From Field - Meta Field ->
From Meta Field - PublishDate
To Field - Modified Date

**Data From Field Example - grabbing Price from meta**

If the site your crawling defines a meta header on each page containing a price, it’s possible to store that numeric data in an Additional Field for searching. Assuming you’ve already defined an Additional Field called `Price`, the following settings would save that meta field in the Additional Field.

**REX Search** - (Empty)
Replace - (Empty)
From Field - Meta Field ->
From Meta Field - Price
To Field - Price

**Data From Field Example - grabbing Price from Text**

The target site might not be organized enough to stick the Price value in a meta header. If every page contains text in the format `Price: $19.95`, Data From Field can key in on that.

**REX Search** - `Price:\s+\$\P=[0-9.]+`
Replace - (Empty)
From Field - Text
From Meta Field - (Empty)
To Field - Price

Notice that we use the field `Text` as the source, not `HTML`. By operating on the formatted text instead of the raw HTML source, it allows proper operation even if the HTML source uses things like `Price: <b>$19.95</b>` or `<td>Price:</td><td>$19.95</td>`.

**Data From Field Example - Subfetch to use PDF contents for a Web Page**

Subfetches allow you to use content from other URLs to populate the current URL’s record. We may have a site about articles, where each article has a web page describing the article, and a link to a PDF of the actual article. We’d like searches that match article contents to take us to the web page, not the article PDF itself.

If the web page has a meta header called “pdfLink” with a URL to the article PDF, we can use the body of the PDF as a replacement for the web page’s body with two DataFromField rules like this:
**3.5.22 Required REX**

Syntax: zero or more REX expressions, separated by whitespace

If specified, all URLs walked by the Search Appliance must match at least one of these expressions. Opposite of Exclusion REX.

**3.5.23 Required Prefix**

Syntax: zero or more URL prefixes, separated by whitespace

If specified, all URLs walked by the Search Appliance must match at least one of these prefixes.

**3.5.24 Max Page Size**

Syntax: a whole number from 1 up

Sets retrieved page size limit to the specified number of bytes. Pages larger than the limit will be truncated - not discarded.

Note: PDF files tend to be very large for the amount of text contained within them. Truncated PDF files are not processable due to their design. Make sure this setting is large enough to handle the largest PDF file you want to index.

**3.5.25 Max Pages**

Syntax: a whole number from -1 up

Limits the number of pages retrieved in a run to the specified number. Use -1 for no limit.
3.5. **ADVANCED WALK SETTINGS**

### 3.5.26 Max Bytes

Syntax: a whole number from -1 up

Limits the number of bytes retrieved in a walk to the specified number. Use -1 for no limit. The actual limit is rounded up to include the size of the last page so that it does not get truncated.

### 3.5.27 Max Depth

Syntax: a whole number from -1 up

Limits the depth of page retrieval to the specified number. Use -1 for no limit. Depth is determined by counting how many links were traversed to reach a particular page. The base URLs are all at depth 0. URLs referred to by the base URL are depth 1, and so on.

### 3.5.28 Max URL Size

Syntax: an integer from 1 through 2033

Limits the size of URLs crawled. URLs longer than this will be skipped. Should not exceed 2033. The default is 1024.

### 3.5.29 Max Requests

Syntax: an integer greater than 0

This gives the maximum number of server requests (page fetches) to make on a single server connection (i.e. Keep-Alive requests), if the server and protocol support multiple requests. Multiple requests per connection increases crawl speed, and is needed for Windows/NTLM-protected pages. The default is 100.

### 3.5.30 Max Connection Lifetime

Syntax: an integer greater than 0

This gives the maximum lifetime (in seconds) for a connection to a server. Multiple requests per connection may be made (if the server and protocol support it) until the connection is this old. The default is 600 (i.e. ten minutes).

### 3.5.31 Page Timeout

Syntax: a whole number from 1 up

Causes the Search Appliance to timeout after the specified number of seconds during each page fetch. This includes the time to lookup the IP address of the host, make the connection to the server, and download a
single page. A timeout does not cause the entire process to quit. That page is just skipped and considered unavailable.

3.5.32 Meta Tags

Syntax: zero or more meta tag names, each on a separate line

This option tells the Search Appliance to look for the specified meta data in fetched documents and store it in the database. Then, this data is included in text searches. The meta tags “Description” and “Keywords” do not need to be specified here because they will be indexed by default. See below.

3.5.33 Standard Meta

Syntax: select Yes or No button

This option indicates whether to automatically extract the standard meta tags “Description” and “Keywords” from HTML documents. If “Yes”, description and keywords meta data will be extracted and stored in their own fields within the database, unlike other meta data which will be collected and placed together into a single meta field in the database. These meta tags will be included in the search with a higher precedence than other meta tags.

3.5.34 All Meta

Syntax: select Yes or No button

Extract all meta data from HTML documents and place this data into the meta field for searching. This eliminates the need to know the name of all possible meta tags, but it also opens the possibility of recording all manner of nonsensical meta data.

3.5.35 Storage Charset

Syntax: standard IANA character set (charset) name

This sets the charset for storing page text in the database during walks. Pages will be translated to this charset when inserted. If a page cannot be translated, it is stored and labeled with its source charset (if known). If left empty (the default) it is UTF-8. This charset should be a superset of US-ASCII (same 7-bit sequences), and translatable by the Search Appliance from all walked pages’ source charsets.

Note that this is not necessarily the charset that search results will be displayed in: see Display Charset under Search Settings. This setting is the default value for Display Charset; see notes under Display Charset.

3.5.36 Source Default Charset

Syntax: a standard IANA character set (charset) name
If the source charset for a walked URL is not labeled and cannot be determined, assume it is this character set. Default is ISO-8859-1. This should only be changed if a large number of walk pages are in an unlabeled different charset, e.g. a Windows charset.

### 3.5.37 XML UTF-8

Syntax: select Yes or No button

Whether to attempt to clean up UTF-8 data for XML output: remove invalid sequences and characters. Should be Yes if XML output (e.g. result style 8) is used (and Storage Charset should be empty). This helps avoid browser errors with XML pages. Note: if XML output is not being used, this should be set to No, as certain characters that are HTML-safe but not XML-safe will be removed if enabled.

### 3.5.38 Keep HTML

Syntax: select Yes or No buttons

Specifies whether to include the named type of text in the database.

**ALT text**

ALT text from IMG or AREA tags.

```
<STRIKE>
```

Text between `<STRIKE>` and `</STRIKE>` tags.

```
<DEL>
```

Text between `<DEL>` and `</DEL>` tags.

```
/Form>
```

Text of form elements, such as `<input>` tags, `<select>` boxes, and `<textarea>` elements.

### 3.5.39 Keep Links

Syntax: select Yes or No buttons

Specifies whether to follow the named type of links when crawling.

**Stylesheet**

Links from `<LINK HREF=... REL=stylesheet>` tags. Note that non-stylesheet `<LINK>` tags will still be followed. The default is N.

```
/Form>
```

Links from `<FORM ACTION=...>` tags. Without the rest of the form properly filled out, such links can often produce nuisance error pages from database-driven sites. The default is N.
3.5.40  Remove Common

Syntax: select Yes or No button

This causes common leading and trailing text from pages to be removed from the database. This is good for eliminating navigation menus and other static boilerplate text at the beginning and/or end of each page.

3.5.41  Ignore Tags

Syntax: one or more pairs of strings, more input boxes are added as you fill string pairs

All data between the specified begin and end will be stripped from the HTML before the text is extracted. These are simple strings, not patterns or REX’s and the case is ignored. This is useful for excluding boilerplate or otherwise unwanted portions of HTML documents.

3.5.42  Keep Tags

Syntax: one or more pairs of strings, more input boxes will be added as you fill string pairs

All data NOT between the specified begin and end will be stripped from the HTML before the text is extracted. These are simple strings, not patterns or REX’s, and the case is ignored. This is useful for extracting prime interest areas of HTML pages without the surrounding boilerplate.

3.5.43  Ignore Characters

Syntax: List of characters

List characters here which should be removed from the text and query. These can be punctuation that is optional. Examples are part numbers, phone numbers, etc. Take care to avoid removing important characters, which you may want to delimit words. E.g. with the setting “-@”, the text “part 123–45@6” would be stored (and searchable as) “part 123456” instead.

3.5.44  Plugin Split

A group of settings that control whether and how to split anytotx plugin output into multiple sub-URLs in the table. Non-text files, such as PDFs, that anytotx processes are often very large or composed of sub-files. The Plugin Split setting allows these files to be split up for finer-grain searching. Split files will cause more than one URL to be entered in the html table (and thus also in potential search results) for the original URL. Such subsequent URLs will have an anchor appended to distinguish them from each other; usually this is the sub-file name, but it may be generic e.g. “#part5” if there are no sub-files. Note: adjusting any of these settings can affect the ability of Refresh-type rewalks to complete successfully (New walks operate as usual).

Depth  The Depth setting controls at what depth to split anytotx output. Each time a multi-file archive is unpacked by anytotx, the depth increases. Depth 0 (the default) means split at the top level (i.e. do not
3.5. ADVANCED WALK SETTINGS

split). Depth 1 would therefore insert each file of a ZIP file as a separate URL in the table.

**Bytes** The Bytes setting controls how many bytes each part will be after the file has been split. The default of 0 indicates do not split. This is useful for large monolithic files that have no detectable sub-file or page structure. If both Pages and Bytes are set, the first limit reached is used for each part.

**AtPage** The AtPage setting controls whether to force the Bytes-controlled splitting to occur at a page boundary (a Ctrl-L). Checking this may make each part arbitrarily larger than the Bytes setting, because a part may extend to the next page break. With this setting unchecked, a part may be up to 50% larger than the Bytes setting, because the page-break check will only go that far over the limit.

**Pages** The Pages setting controls how many pages to group in a part. The default of 0 does not split at all. If both Pages and Bytes are set, the first limit reached is used for each part. For example, setting Pages to 10 and Bytes to 100000 would break at 10 pages or 100KB, whichever comes first. This is useful to catch page-bounded documents like PDFs, and simultaneously avoid generating huge text for non-paged documents.

Plugin Split was added in version 4.03.1049838346 Apr 8 2003.

### 3.5.45 Language Analysis

If **Enable** is set to **Y**, pages walked are processed through the Language Analysis Module (LAM), obtained and installed separately. This module helps support searching in languages such as Chinese, Japanese and Korean, where there is often no whitespace to delineate one “word” (logogram, or group of characters) from another, making searching difficult. The Language Analysis Module inserts spaces between words in the text of such pages, enabling ordinary non-wildcard searches to match better. At search time, users’ queries are also passed through the module, so that they can match the processed pages’ text.

**Language**

A two-letter ISO 639 language code “hint” for the LAM. If all or a majority of the crawled data is a single language, entering that language’s code here will help the LAM process data better. The default is empty (no hint). Added in Texis version 6.00.1294975881 20110113.

**Preserve 7-bit**

Whether to preserve the separation of all-7-bit tokens. Sometimes the LAM will separate alphanumeric tokens that are not language words, e.g. part numbers, causing search problems. Setting this to **Y** will attempt to preserve the separation (or lack thereof) of all-7-bit tokens in the crawled text.

### 3.5.46 CJK Mode

Syntax: select **Yes** or **No**

**CJK Mode** modifies the crawl and the search for better handling many Chinese, Japanese, and Korean queries.

At index time, multi-byte UTF-8 characters are indexed as individual words. At search time, multi-byte UTF-8 characters in the query are separated by spaces, and quotes surround the sequence to make it a
phrase.
This allows the query to match where spacing may cause it to otherwise not match.

### 3.5.47 Word Definition

Syntax: one or more regular expressions (REX), each on a separate line

Sets the word matching expression(s). Each line is a regular expression defining what is considered a word within the textual content of the retrieved documents during the index process. The default expressions index normal words and some special items such as domain names.

You may supply multiple expressions, one per line, if you can’t define your idea of all possible words in one expression.

For example, `\alpha=\text{alnum}{1,20}` will index “words” beginning with an alphabetic character followed by 1 to 20 alphabetic or numeric characters.

If Word Definition is changed, the Language Characters setting (p. 75) should generally be updated to reflect any new characters added.

Changing the word definition with Update instead of Update and GO will cause the existing search index on the data to be dropped and rebuilt. The database will not be searchable during the time that the index is being rebuilt; this may take several minutes or more for large profiles.

### 3.5.48 Text Search Mode

Syntax: select from options or enter custom mode

(Note: In earlier releases this setting was known as Character Match Mode.)

Sets the character-matching mode for text (keyword) searches. This controls aspects like case-sensitivity, ignoring accents, etc. The selectable values are:

- **Loose** - Ignore case, ignore diacritics (accents), expand ligatures, ignore width differences. Storage Charset should be empty or UTF-8, though ISO-8859-1 may sometimes work. With this mode, not only will a lower-case “e” match an upper-case “E” and vice-versa (ignore case), but “e” will match “é” (Unicode U+00E9), “œ” will match “œ” (U+0153), and full-width will match half-width characters (for ASCII and katakana).

- **Strict** - Ignore case only. “e” will match “E”, but not “é”. Storage Charset should be empty or UTF-8, though ISO-8859-1 may sometimes work.

- **Strict ISO-8859-1** - Ignore case only, and assume Storage Charset is ISO-8859-1. For back-compatibility. Available only for Text Search Mode.

- **Exact** - Match characters exactly, respecting case, diacritics, width etc. Available only for Attribute Compare Mode.
3.5. ADVANCED WALK SETTINGS

- **Custom → -** Use the custom mode entered in the **Custom Mode** box. This is a comma-separated list composed from the following tokens; consult Thunderstone tech support for advice:

  - **iso-8859-1** - Assume text is ISO-8859-1 encoded. Should only be used if **Storage Charset** is also ISO-8859-1. If this flag is not set, text is assumed to be UTF-8, though occasional ISO-8859-1 characters will usually be able to match their UTF-8 equivalents.

  - **ignorediacritics** - Ignore diacritic marks (accents, umlauts, etc.). E.g. “é” will match “é” (U+00E9) and vice-versa.

  - **expandligatures** - Expand ligature characters. E.g. “oe” will match “œ” (U+0153) and vice-versa. Note that with this flag off, certain ligatures may still be expanded if necessary for case-folding with ignorecase.

  - **ignorewidth** - Ignore half-/full-width differences, e.g. for ASCII and katakana characters.

  - **ignorecase** - Ignore case differences, e.g. “e” matches “E” and vice-versa; this is the default. The alternative is **respectcase**.

  - **respectcase** - Case-sensitive search, e.g. “e” does **not** match “E”. The alternative is ignorecase.

  - **unicodemulti** - Use Unicode case-compare tables, with multi-character expansions where needed (e.g. for ligatures). The alternative is **ctype** or unicodemono.

  - **unicodemono** - Use Unicode case-compare tables, but do not expand characters. The alternative is **ctype** or unicodemulti.

  - **ctype** - Use the operating system’s **ctype.h** case-compare tables. Only codepoints U+0001 through U+00FF (i.e. single-byte or ISO-8859-1 range) are supported, though the actual encoding may be ISO-8859-1 or UTF-8 depending on the **iso-8859-1** flag. The alternative is unicodemulti or unicodemono.

**Note:** Changing the **Text Search Mode** setting will cause text search indexes to be rebuilt, which may take several minutes or more for large profiles.

### 3.5.49 Attribute Compare Mode

**Syntax:** select from options or enter custom mode

Sets the character-matching mode for attribute comparison searches, e.g. equals, less-than, order-by, IN. This controls aspects like case-sensitivity, ignoring accents, etc. See **Text Search Mode** (p. 42) for details on what the setting values mean. The default is **Exact**. Note that searches on **Enum** fields are unaffected by this setting, as the **Enum** type is defined to be case-insensitive.

**Note:** Changing the **Attribute Compare Mode** setting will cause **Extra Indexes** (if any) to be rebuilt. This may take a few minutes on large profiles, and may prevent crawls from proceeding until the indexes finish.

### 3.5.50 Index Fields

**Syntax:** list of fields ordered by desired weight
These fields will be searched by the user’s text query. Fields listed higher will be weighted higher in search results, according to the Position in Text search setting.

Note that changing these fields will cause indexes to be rebuilt, which may take several minutes or more for large-data profiles. The old setting will be used until the index rebuild is complete.

### 3.5.51 Compound Index Fields

Syntax: list of field(s) from select boxes, any order

These fields will be indexed along with Index Fields, but in the compound portion of the main search index. They are not searched by the text query, but are used to improve accuracy and performance for certain ancillary queries performed in addition to the main text search, such as when ordering results by last-modified date, or searching by Depth. The default values are Visited, Modified, Depth and Pop.

The selected fields may be in any order; they are used only when needed, unlike Index Fields, all of which are always searched by the user’s text query. Note the following caveats:

Adding a field to Compound Index Fields will not help search performance if there is no main (text) query also, as the compound part of the index can only be used in conjunction with a text query.

Only a fixed-size amount of data can be stored in each row of each of the Compound Index Fields, so only fixed-size fields such as dates, integers, numbers, etc. should be chosen. If text data is used, all values for the field in the database should be small (a few characters) for best performance.

Note that as this is the same overall index as Index Fields, changing any of these fields will cause indexes to be rebuilt, which may take several minutes or more for large-data profiles. The old setting(s) will be used until the index rebuild is complete.

### 3.5.52 Extra Indexes

Syntax: select-box for index type and table, text box to enter index name and fields

Extra Indexes may be created to improve search performance and accuracy in situations where the main text index (Index Fields) and/or its Compound Index Fields are not sufficient. They are not generally created unless suggested by Thunderstone tech support for certain queries.

Note that creating an Extra Index on a large-data profile may take several minutes or more. If the index Type is not Metamorph nor Metamorph Inverted, creating the index may also impede crawls or other database modifications. Non-Metamorph/Metamorph-Inverted indexes should therefore be created before the profile is crawled or populated with data to avoid this issue, if possible. Extra Indexes should only be created when the profile is not actively crawling, to minimize load and potential crawl impediments.

### 3.5.53 Spell-check Dictionaries

Syntax: select-box choice
This setting controls what dictionaries to create for spell checking. The default (Create all) is to create all needed dictionaries. However, this can consume significant time and memory for some large-data profiles, so to conserve system resources, only the multi-word-occurrence dictionary may be created (Create multi-word only). This may reduce spell-check suggestions at search time however. To further conserve system resources, no dictionaries at all may be created (None). This will disable spell checking at search time.

### 3.5.54 Primer Type

“Primer URLs” are URLs that are fetched before actually starting a crawl. They are not stored in the search database, but instead are used to “prime” the Search Appliance with any necessary credentials (e.g. login cookies) for accessing the rest of the site. By default, the Base URL is used, in case any session/ASP cookies are needed.

The Primer Type setting specifies which (if any) urls are used to prime the profile:

- **None** - No primer URL is used. The Base URLs are crawled as normal.
- **Base URL** - the Base URLs are used to prime the walk. This differs from None in that the base URLs are submitted once and the results discarded, and then submitted again for crawling. This is useful in situations where the Base URL contains login information, and the page returns “thank you for logging in” with no other content until the page is requested again.
- **Custom** - The URLs listed in the Custom Primer URLs setting are used, as described below.

For HTTP Basic or NTLM protected web sites, the Login Info setting should be used instead.

### 3.5.55 Primer URLs

Syntax: URL, optional variables, optional bad-login query, optional URL query

When the Primer Type setting is set to Custom, the Primer URLs setting values take effect. There are two ways to use a custom primer URL - submitting the form directly, and filling out the form.

**Submitting the Form Directly: Custom Primer URL**

If a form-based login must be filled out before accessing a site, the Custom Primer URL can be set to the `<FORM ACTION>` URL of the login (fully-qualified), with any form variables (e.g. user/pass) filled out in the query string. If the `<FORM METHOD>` must be POST instead of GET, the URL protocol may be changed to the pseudo-protocol “http-post”. E.g.:


would be submitted using the POST method, with the given query-string variables sent as the content. Note that the query-string variables and values should be URL-encoded.
Filling Out the Form: Custom Primer Variables

Sometimes submitting the form directly is not sufficient. Forms on web pages can contain dynamic hidden variables, such as a `viewstate` for session tracking. This means the form must be opened, filled out, and submitted, instead of simply submitting a pre-defined action URL.

This is achievable with the **Custom Primer Variables** setting. Instead of setting **Custom Primer URL** to the action of the login form, you set it to the URL of the page that contains the form. **Custom Primer Variables** is a URL-encoded list of name/value pairs to set on the **Custom Primer URL** page.

When **Custom Primer Variables** is set, the **Custom Primer URL** is fetched, and then the variables specified in **Custom Primer Variables** are used on the form, and then *that* form is submitted.

For example, let’s say there’s a `pleaseLogin.asp` page that submits to `checkLogin.asp`, and the form contains a dynamic state that has to be included or `checkLogin.asp` will reject the login. If you set **Custom Primer URL** to

```
http://login.acme.com/pleaseLogin.asp
```

and set **Custom Primer Variables** to

```
User=Admin&Pass=open%26close
```

The `pleaseLogin.asp` page will be fetched, the form field `User` will be set to `Admin` and `Pass` will be set to `open&close` (note the URL-encoding), and then form on the `pleaseLogin.asp` page will be submitted, going to `checkLogin.asp`.

This means that if the form on `pleaseLogin.asp` contains

```
<input type="hidden" name="sessionstate" value="abc123xyz"/>
```

then that hidden variable will be submitted along with the rest of the form.

Checking for Bad Logins: Bad Login MM Query

Sometimes, the primer URL login may fail, e.g. bad login. However, since the only error indication may be a “Login failure”-type message and not a true HTTP error code, the Search Appliance may not be able to detect this and might continue walking useless (permission-denied or “Please log in first”) pages.

To help detect such a primer URL failure, a **Bad Login MM Query** may be entered. If non-empty, this is a Metamorph query to run against the HTML returned from the associated primer URL. If it matches, the primer URL is considered a failure, and the crawl is stopped for that particular site (other Base URLs will continue).
3.5. ADVANCED WALK SETTINGS

**Multiple Primers: Base URL MM Query**

If multiple custom primer URLs are being used, you can control which ones are used for which Base URLs via Base URL MM Query.

By default, primer URLs are only used on Base URLs that have a matching protocol and hostname. If **Base URL MM Query** is non-empty, then this Metamorph query will be run against the Base URL being crawled. The associated primer URL will only be fetched if it matches.

### 3.5.56 Login Info

**Syntax:** name and password

Specify a username and password for sites that require a login to view certain pages. These are used with HTTP Basic, Windows NTLM, and FTP authentication. Other authentication methods are not supported currently. Without proper login, protected pages will be skipped.

If this is a domain account, enter both in the Username field, separated by a forward slash (/), i.e. `MY_DOMAIN/myuser`.

If you are trying to walk a site where a login form is provided on a web page, you may be able to walk it by using the action URL from the form with the form variables encoded onto the end as your base URL. For example if the form variable names were `Uname` and `Upass` and the action URL was `http://www.mysite.com/login.asp` you may be able to use a URL like `http://SERVER/login.asp?Uname=YOURNAME&Upass=YOURPASSWORD`

**Note:** The search interface displays hit context and has an option to view the entire text of the page. This allows search users to view “protected” pages without entering a password.

### 3.5.57 Proxy

**Syntax:** the full URL to a web proxy server

This specifies the URL (not just hostname) of a proxy web server through which to pass page fetch requests. Blank means don’t use a proxy.

### 3.5.58 Proxy Login Info

Sets the user name and password to authenticate to proxy servers, using the `Proxy-Authenticate` header and Basic Authentication. Used if the Proxy URL is filled in. Added in version 4.01.1031600000 Sep 9 2002.
3.5.59 Cookie Source Path

File path to a Netscape or Microsoft Internet Explorer format cookie file to read at start up. This allows persistent cookies saved by a browser to be read by the Search Appliance, so it can inherit the browser’s state. This is not recommended with the Search Appliance as it would require exporting a filesystem with your cookie file and mounting it to the Search Appliance. Then every walk would be dependent on that machine being online and the cookie file being present.

3.5.60 Off-Site Pages

Syntax: select Yes or No button

Allow retrieval of individual off-site pages. By default the Search Appliance will not retrieve pages that are not on the same host as the base URL(s). Using this option, pages not on the same machine will be retrieved, but none of the pages that they reference will be walked.

3.5.61 Off-Site Components

Syntax: select Yes or No button

This option also allows off-site resources embedded within on-site pages to be fetched for processing. This includes javascript sources, embedded frames, and redirects.

3.5.62 Stay Under

Syntax: select Yes or No button

When this flag is Yes, walks will stay under the directory specified in the base URL(s). When this is No, if a hyperlink to another location on the same site is encountered, the will follow the link. In neither case will the walk go to other sites unless they are in the list of walk URLs or allowed domains or networks.

3.5.63 Prevent Duplicates

Syntax: select Yes or No button

This option enables extra checking for duplicate documents. Documents with the same content are only be stored once, even if their URLs are different. This is accomplished by hashing the textual content of the page and not storing any page with a hash code that is already in the database.

3.5.64 Duplicate Check Fields

Syntax: checkboxes to choose fields
3.5. ADVANCED WALK SETTINGS

These are the fields which will be checked for duplicate prevention (if Prevent Duplicates is enabled). The concatenation of these fields is hashed for each incoming document, and if the hash is the same as an existing document, the incoming document will be discarded as a duplicate.

By default, only Body is checked, as the body is the majority of search content for a document, and thus another document that has an identical body should be considered a duplicate even if it has a slightly different title or description.

However, sometimes errors in processing (e.g. anytotx) can cause the bodies of large numbers of documents to become empty and thus be considered duplicates of each other and removed. In this case it may be desirable to either turn off Prevent Duplicates or check more fields in Duplicate Check Fields.

Note: Changing Duplicate Check Fields after a walk has completed (i.e. before a later Refresh type walk) may cause new documents to not be removed as duplicates as expected, since the pre-existing documents’ hashes are now for a different set of fields. This will not cause errors or corruption; it just might leave some newly-duplicate documents in the database.

3.5.65 Store Refs

Syntax: select Yes or No button

Controls whether URLs referenced by retrieved pages are added to the refs table. This can save some time during the walk, as well as, disk space if it’s turned off. But turning it off prevents the “Show Parents” option in the search from working. It also reduces the detail available from walk error reports.

3.5.66 Inline Iframes

Syntax: select Yes or No button

This indicates whether to treat iframes as a part of the page they are on or as separate stand alone pages. Selecting Yes will make them part of the page. Selecting no will make them separate.

3.5.67 Max Frames

Syntax: a whole number from 0 up

This indicates the maximum number of frames allowed on a page. Pages with more frames than this are discarded. If this is set to 0, the frames of framed documents are treated as independent, stand-alone pages.

3.5.68 Execute JavaScript

Syntax: select Yes or No button

Execute JavaScript that is contained on fetched pages and that might alter or generate the page content and URLs.
3.5.69 Fetch JavaScript

Syntax: select Yes or No button

Fetch JavaScript that resides at a separate URL instead of being inline on the page (e.g. `<SCRIPT SRC>` tags).

3.5.70 JavaScript String Links

Syntax: select appropriate checkboxes

Sets which additional sources of potential JavaScript links to check. Some JavaScript links may not be found when scripts on a walked page are executed, so the internal list of all JavaScript string objects is scanned for potential URLs according to the checked boxes. Menu will look for common JavaScript menu navigation system links; Protocol will look for strings that look like valid fully-qualified Web links; File will look for probable file strings.

Note that any of these sources may potentially find incorrect links, especially the File type. Checking File is generally used only as a last-ditch effort to find some JavaScript links.

3.5.71 Debug JavaScript

Syntax: select Yes or No button

Print additional debugging messages for JavaScript errors.

3.5.72 JavaScript Memory

Syntax: numeric memory size e.g. 20MB

Alters the max amount of memory allowed for running JavaScript. The default (if the setting is empty) is 20MB. Increasing the limit may help if error messages such as “JavaScript exceeded scriptmem limit” are encountered. Note that the Maximum Process Size limit setting may also need to be increased if this is increased.

3.5.73 JavaScript Timeout

Syntax: integer

Max time, in seconds, to allow for running JavaScript. The default (if the setting is empty) is 5 seconds. Large or complex JavaScript pages may require more time, e.g. if “JavaScript exceeded scripttimeout” messages are received.
3.5. ADVANCED WALK SETTINGS

3.5.74 Protocols

Select which protocols to allow to be fetched. If a protocol is not enabled, but the Base URL uses it, it will be automatically enabled for the walk. The protocols currently supported are http, https, ftp, gopher and file.

3.5.75 HTTP Version

What HTTP version to use for requests. HTTP/1.1 enables compression (gzip, chunked, compress, deflate Content-Encoding) and is the default for products using Texis version 6 and later. HTTP/1.0 was the default for previous versions. HTTP/0.9 is of limited/no use.

3.5.76 SSL Client Protocols

Which SSL protocols to allow for client HTTPS/SSL connections when crawling and searching, i.e. for connections from the Search Appliance to remote https:// URLs. The default is to leave all protocols enabled for maximum compatibility; the most-secure protocol will then be negotiated. However, sometimes the connection fails at (or soon after) the negotiation, possibly with the error message “Missing HTTP response line in reply from...”. This may be due to settings on the remote server that disallow certain SSL protocols. In such cases, disabling various SSL protocols under SSL Client Protocols may enable the connection to succeed.

Note: To change the server-side SSL protocols accepted by the Search Appliance, see HTTPS/SSL Protocols under System Wide Settings.

3.5.77 Authentication Schemes

Select which authentication schemes to allow for password-protected URLs. The settable schemes are Basic, File (for file:// URLs), NTLMv1 and NTLMv2. NTLMv2 requires Texis version 5.01.1213917000 20080619 or later. Note that the scheme(s) actually accepted for a given URL are determined by the server; if none of the server-offered schemes are enabled by this setting, then the protected URL cannot be walked. This setting can be used to disable less-secure or undesired schemes, such as Basic or NTLMv1 authentication.

3.5.78 Embedded Security

Select the security for embedded objects on a page (e.g. frames, scripts). Any fetches any required object. Non-decreasing will fetch a required object if its security (https:// vs. non-https:// in the URL) is not less than the main page, i.e. an https:// object on an http:// page will be fetched, but not vice-versa. Non-increasing is the opposite. Same protocol requires that the protocol of the object be the same as the main page.
3.5.79 Entropy Source

Selects standard (default) or alternate entropy source. Entropy is used to initialize the SSL/https plugin. The standard sources should be sufficient; the alternate source is only needed if the prngd daemon (some Unix platforms) is required but cannot be successfully run. Note: Setting the source to Alternate will decrease SSL/https security.

3.5.80 Multiple Fetches

Syntax: select Y or N

Multiple Fetches allows a page to be fetched multiple times, and can potentially slow down a crawl. It should only be used in specific situations in conjunction with Off-Site Pages.

For example, Consider the situation of crawling two sites, a.com and b.com with Off-Site Pages enabled. A link from a page on a.com to b.com/page.htm is considered off-site, so it will be crawled but its links won’t. Then, when b.com starts its crawl, b.com/page.htm won’t be processed because it’s already been done, causing b.com/page.htm’s links to not be included.

Multiple Fetches allows the 2nd encounter of b.com/page.htm to be processed again, which will allow its links to be properly processed.

3.5.81 Follow Cross-Site Links

Syntax: select Y or N

When crawling multiple hosts, setting Follow Cross-Site Links to Y will allow links from one host to another to be respected, as opposed to only starting from each host’s Base URLs.

If you have a lot of Base URLs that have lots of duplicate links to each other that would’ve been found on-site anyway, setting Follow Cross-Site Links to N can improve crawl performance.

3.5.82 Max Redirects

Syntax: a whole number from 0 up or -1

This indicates the maximum number of redirects that are followed when attempting to retrieve a page. If set to -1 then redirects will not be followed when attempting to retrieve the page, but will be treated as a link.

3.5.83 Empty Form Redirects

Syntax: select Y or N

Some crawled pages implement a redirect by having a HTML form that points to the target, and uses JavaScript to submit the form.
If Empty Form Redirects is set to Y and a page doesn’t have any content, the Search Appliance will treat any HTML <form> targets on the page as a redirect.

### 3.5.84 Index Name

**Syntax:** one or more filenames separated by space

Set the filename assumed for directory URLs. The default is “index.html” and “index.htm”. This filename will be removed from stored URLs to prevent redundant fetches of the page. So the URLs “http://www.mysite.com/fun/” and “http://www.mysite.com/fun/index.html” will be considered the same and only be fetched once (as http://www.mysite.com/fun/).

### 3.5.85 DNS Mode

**Syntax:** choose from drop down list

This controls how the Search Appliance looks up IP addresses for hostnames. “Internal” uses Texit’s own internal parallelizing name lookup routines. “System” uses the standard system routines. You should use “Internal” unless it causes compatibility problems.

### 3.5.86 User Agent

**Syntax:** full user-agent string

Set the User-Agent (browser type) to report to web servers. Normally the Search Appliance reports itself as Mozilla version 4.0. Modify this setting to report as a different user agent. If you want to emulate a particular browser, you can access your site with that browser, then check the site’s transfer log to see what user agent string was logged (typically the last double-quoted entry on the line).

### 3.5.87 Mime Types

**Syntax:** one or more acceptable MIME types, each on a separate line

These are the Multipurpose Internet Mail Extensions (MIME) types that the Search Appliance informs the web server are acceptable. MIME types have the syntax type/subtype. Either type or subtype may be * to mean “any”. By default all MIME types are allowed (*/*).

### 3.5.88 Respect Expires Header

**Syntax:** choose from drop down list

For refresh-type walks, this controls how the Expires header is used. Set to No the Expires header will be ignored. Set to Limited the Expires header will be used, but limited by the Minimum and Maximum Refresh Times. Set to Yes the Expires header will be treated as definitive.
Invalid and out of range headers will be ignored, with the exception of ”0”.

3.5.89 Default Refresh Time

Syntax: choose from drop down list

For refresh-type walks, this is the default time period to initially try refreshing a URL; typically set to 1 minute. Note that the actual refresh period is dynamically computed for each URL based on how often it changes.

3.5.90 Minimum Refresh Time

Syntax: choose from drop down list

For refresh-type walks, this is the minimum time period to try refreshing a URL. The actual refresh period is dynamically computed for each URL based on how often it changes, and will not be less than this value. This prevents too much time being spent refreshing a very dynamic page (i.e. constantly refreshing it and loading the web server). Typically set to 1 minute.

3.5.91 Maximum Refresh Time

Syntax: choose from drop down list

For refresh-type walks, this is the maximum time period to try refreshing a URL. The actual refresh period is dynamically computed for each URL based on how often it changes, and will not be greater than this value. This ensures that all URLs – even relatively static ones – are eventually checked for changes.

3.5.92 Maximum Process Size

Syntax: choose from drop down list

Upper limit to memory size of walker processes. If a walker process exceeds this limit, it is re-started (at the same point it left off) by the dispatcher, at most once. If the same child repeatedly exceeds this limit, the walk may stop until it is re-started via schedule or manually.

3.5.93 Maximum Load Average

Syntax: number, or -1 for no limit

Maximum Load Average helps prevent the Search Appliance from becoming overloaded. If the load goes above the specified Maximum Load Average, the crawl will pause itself until the load decreases.

You can see the current load of the appliance at any time by going to Maintenance -> System Information, next to Load. The 3 numbers represent the average load during the last 1, 5, and 15 minutes.
3.5.94 Replication Settings

Syntax: List of hosts and profiles

A list of hosts and profiles to send walk data updates to. The hosts must have the sending server listed as a cluster member under the system-wide settings.

3.5.95 Batch Rows

Syntax: number

Defines the number of items the replication sender will attempt to accumulate in a single batch. This should not need changed.

3.5.96 Batch Size

Syntax: number (in bytes)

Defines the threshold for size for a sending a batch of replication items. When collecting items to replicate, once the size of the items is over this threshold, the batch will be sent off to the targets. This should not need changed.

3.5.97 Batch Idle

Syntax: number (in seconds)

Defines the idle timeout for sending a batch of replication items. When collecting a batch, if no new items appear for this many seconds, the replication batch will be sent to the targets. This should not need changed.

3.5.98 Log Replication

Writes information for this profile’s replication queue processor to replication.log.

If both the System-wide Log All Replication and this profile’s Log Replication are set, logging for this profile will be the more verbose of the two.

See also “Replication” 4.19.

3.6 Search Settings

This group of options applies to the standard search and provides a convenient way to make common changes to the search behavior and appearance.

See also “Customizing the Search Appliance’s Appearance” 2.2.
3.6.1 Notes

This is the same setting as Notes under Walk Settings: a scratch pad area for the administrator of the profile. It in no way affects the walk or search.

3.6.2 Query Logging

Syntax: select Yes or No button

This indicates whether the search should log user queries. If Yes, users’ queries are logged to the querylog table of the database. The contents of this table may be viewed from the Query Log menu of the Administrative Interface.

Note: The query log table gets erased during every new walk. You will only be able to view queries that have occurred since the latest new walk. Refresh walks do not cause the table to be erased.

3.6.3 Rotate Schedule

Syntax: The day of week (or daily) and the time of day to rotate

This selects when to rotate query logs on this profile. During a rotate action, the log table data is optionally e-mailed to someone, and then the data is erased from the log table.

See also Attach Logs (section 3.5.3).

3.6.4 Email

Syntax: A valid e-mail address

When the query log is rotated (according to the schedule set), an e-mail message with an attached file (containing the previous log data) is sent to this address. Multiple addresses may be specified, separated by commas.

3.6.5 Result Order

Syntax: select Relevance, Date, or URL button

This determines the default ordering of search results.

- **Rank** - search results are ordered by rank (or relevance) by default.
- **Date** - search results are ordered by date descending (newest first) by default.
- **URL** - search results ordered by their URLs alphabetically by default.

Search users may select the alternate ordering from this default in the Advanced search form.
3.6. SEARCH SETTINGS

3.6.6 Results Style

Syntax: choose from drop down list

This controls the style used for displaying individual answers to user queries. There are various styles from which to choose. The arrangement and amount of information varies in every style. In the administrative interface you may click the question mark (?) next to “Results Style” to see a sample of each of the available styles.

3.6.7 Allow RSS

Syntax: select Yes or No button

If Allow RSS is set to Y, then each search result page will include a reference to an RSS feed for that search, which users will be able to monitor.

Setting Allow RSS to N will both remove the reference from search result pages, and disallow the viewing of RSS feeds.

3.6.8 Format XSL Output

Syntax: select Yes or No button

If set to Y, then extra line breaks are added in to the output of the server-side XSL stylesheet processing. This has the following effects:

- It makes the HTML output more readable by humans, changing it from one extremely long line to a well formated document.

- It adds a small amount of size to the document (usually between 1-4%)

- Adding line breaks at certain locations can sometimes trigger odd rendering bugs in Internet Explorer (adding spaces where there shouldn’t be spaces).

3.6.9 XSL Engine

Syntax: Choose Internal (recommended) or Legacy

the Search Appliance recently changed its XSL processing from an external tool to an internal library. All processing should use the new Internal engine.

This switch shouldn’t cause any issues, but in case there are quirks, the XSL Engine setting allows profiles to change back to the old Legacy engine until any issues with the Internal engine are ironed out.

This feature will be deprecated in the future, and the Legacy engine completely removed.
3.6.10 XSL File

Syntax: Browse local disk for a XSL file

This allows the use of a customized XSL file to format the output of a search. A default XSL style sheet is included with the Search Appliance (/xsl/default.xsl). The XSL File option is used only if the Results Style is set to XSL Stylesheet. The links below this option display the current XSL stylesheets, which may be downloaded for editing and then re-uploaded with this option.

3.6.11 Abstract Style

Syntax: choose from drop down list

This setting controls the short description or abstract that is generated for each search result. Choosing Query uses a snippet that matches the query. Beginning uses the start of the document’s content. Top uses the top of the current page. Description uses the value of the Description meta tag.

3.6.12 Abstract Length

Syntax: enter number in text box

This determines the length in bytes of the document abstract.

3.6.13 Max Title Length

Syntax: enter number in text box

This determines the maximum length in bytes of the document title shown in the results. If the title is over this length, it will be truncated and ended with ellipses.

Title length may be expanded up to 10 characters over this setting in order to avoid cutting off in the middle of a word.

Set to −1 to always use the full title.

3.6.14 Max URL Display Length

Syntax: enter number in text box

This determines the maximum length in bytes of the matching URL shown in the results. If the title is over this length, it will be truncated after the hostname with ellipses and ended with as much of the path and filename as it can.

Note that this does not affect the URL that is actually linked to - that URL is always the full, proper URL. This setting only affects the displayed URL.

Set to −1 to always use the full URL.
3.6. **SEARCH SETTINGS**

3.6.15 **Results per Page**

Syntax: a whole number

This controls the number of results (answers) listed on each results page. When there are more than this many answers to a user’s query the user will have to hit “next” to see more answers.

3.6.16 **Max User Results per Page**

Syntax: a whole number, or -1 to disable

Search users are able to customize how many hits per page they see by supplying the parameter \( \text{rpp} \). This setting places an upper bound on how many results per page they can request. This prevents someone from requesting 1000000 results on a page and bogging down the search system.

If set to \(-1\), then all \( \text{rpp} \) parameters are ignored.

3.6.17 **Page Links Shown**

Syntax: a whole number, defaults to 10

This specifies the number of page links to include in the summary of the results.

For example, if we are on page 22 of 5,000 total results, by default direct links will be shown to pages 18 through 27 (for a total of 10 links). If \text{Page Links Shown} is set to 20, it will show links 13 through 32, for a total of 20 page links.

3.6.18 **Results per Site**

Syntax: an integer select box and Yes/No button

The **Max** setting controls the maximum results per site per page to display. For large profiles with many pages (and thus results) per site, setting Results per Site can increase the results variety shown on a single page, by replacing some same-site results with lesser-ranked but different-site results from subsequent pages.

When results are limited to \( N \) per site, no more than \( N \) results for any given site will be shown on any given page. Results past \( N \) for a site are suppressed, and results from new sites (that are not past \( N \) yet) added, until the page is full. Once the page is complete, the results are reordered: the second and later results from a site are moved up under the first result from that site, indented, and followed by a More results for site link. The next page’s results will be obtained by the same process, resuming at the point in raw results left off by the previous page. Note that a given site may appear on subsequent pages (if there are more results for it), but its results that were suppressed for the previous page will not be shown (because they are visible via the previous page’s More results for site link). Also, since there are now two degrees of navigation through the results – standard pagination, plus the More results for site links – not all of the total results counted may be shown via pagination: the rest are shown via More results for site.
Note also that setting Results per Site to other than Unlimited can increase search time, as potentially much more than one page of raw results must be obtained and suppressed, and results must be regrouped.

The Allow override button controls whether the search user can override the profile’s Results per Site limit on the Advanced Search form. This can be set to N to prevent the potential delay of grouping by site, or Y to allow the user to set a custom value. For profiles that are Meta Search back-ends, if the front-end Meta Search is using Results per Site, all the back-ends should have Allow override set to Y so that the front-end’s value can be used, for consistency.

3.6.19 Allow site: syntax

Syntax: a Yes/No button

This controls whether to allow the site:host query syntax in a search, to limit results to a single domain. It has no effect on the From this domain box on the Advanced Search form, which uses a separate variable (sq) instead of embedding in the query. For profiles that are Meta Search back-ends, if the front-end Meta Search is using Results per Site, all the back-ends should have Allow site: syntax set to Y so that the front-end’s value can be passed via the site:host syntax.

3.6.20 Results Width

Syntax: a whole number or a percentage valid for an HTML <TABLE> WIDTH

This controls the width of the <TABLE>s used in the search results. This may be a number indicating a fixed width or a number from 1 to 100 followed by a percent sign(%). This tells the user’s web browser how wide to make the table.

3.6.21 Box Color

Syntax: a color name or number valid for HTML color specification

This controls the color of the “gray” informational boxes at the top and bottom of search results pages.

3.6.22 Display Thunderstone logo on results

Syntax: select Yes or No button

This controls the display of the Thunderstone logo on the search results page. The logo is displayed on the first and last page of a search.

3.6.23 Show Advanced Search

Syntax: select Yes or No button
This controls whether or not the Advanced Search button is displayed on the search form. If set to No then the button will be hidden, otherwise it will be displayed.

### 3.6.24 Results Highlighting

Syntax: select None, Classes, Inline or Bold

The user’s query will be highlighted in various parts of the search results (Title, Abstract, etc.) with the selected method:

- **None or N** - No highlighting will be done in search results.
- **Classes or Y** - Terms will be highlighted with `<span>` tags that refer to classes that should be defined in a separate CSS file, e.g. the `/common/search.css` file, which can be edited to customize the highlighting style. Each term in the query is highlighted with a different class (in a different color, by default).
- **Inline** - Terms will be highlighted with `<span>` tags that directly specify a fixed CSS style. This is not customizable, but is self-contained and does not depend on a separate stylesheet or file. Same visual result as Classes with the default CSS.
- **Bold** - Terms will be highlighted with `<b>` tags.

The default is **Bold**.

### 3.6.25 Context Highlighting

Syntax: select None, Classes, Inline or Bold

The user’s query will be highlighted in the context view (Match Info page) with the selected method. Same choices as for **Results Highlighting**. The default is **Classes**.

### 3.6.26 PDF Query Highlighting

Syntax: select Yes or No button

When making links to PDFs in search results, the Search Appliance will add extra info to the link which will cause the user’s query to be highlighted by the PDF viewer. Changing this setting to “N” will remove that extra information from the link, and no longer highlight the user’s query in the PDF document.

### 3.6.27 Font

Syntax: a font name valid for HTML `<FONT>` specification

This specifies the font to use throughout the search interface.


3.6.28 Display Charset

Syntax: a standard IANA charset name

This sets the charset used to display search results in. The default if empty is the charset for Storage Charset under All Walk Settings. This charset should be a superset of US-ASCII (same 7-bit sequences), compatible with Top HTML, and translatable by the Search Appliance from Storage Charset.

A <META HTTP-EQUIV=Content-Type> tag in Top HTML will be updated automatically to reflect this charset. This update can be disabled by putting 2 or more spaces between META and HTTP-EQUIV in Top HTML.

Note that if the Display Charset differs from the Storage Charset, search results must be converted on-the-fly, potentially degrading performance slightly. Thus, if Display Charset is ever changed, it is recommended that Storage Charset be changed as well, and after the next rewalk (when all the database data is now in the new Storage Charset), Display Charset be change back to default (empty, which will still display in the new Storage Charset).

3.6.29 Top HTML and Bottom HTML

Syntax: HTML

This is static HTML to place at the beginning and ending of every search page respectively. It is useful for setting styles and displaying navigation menus and otherwise making the search pages look like the rest of your site.

Top and Bottom HTML when placed together should be exactly what is required to create a complete and valid HTML page. You can use your favorite HTML editor to create a page with a placeholder for the search form and results. Then cut and paste the section of HTML before the placeholder into the Top HTML and the section of HTML after the placeholder into the Bottom HTML.

If $query$ occurs within these fields, it will be replaced by the user’s query.

CSS Stylesheet

Top HTML should always include a <link> to the CSS stylesheet /common/search.css, which is in the web server document root tree. This contains styles for hit-highlighting and other search functionality. While it may be edited to change these styles, it is more portable to add a separate stylesheet with any custom styles, included after search.css. That way, any future Search Appliance upgrades will upgrade stock styles as needed, but not affect any custom styles in separate files.

3.6.30 Enable Sherlock

Syntax: select Yes or No button

This informs the search to include comment tags in the results page to allow Sherlock to process the list. Sherlock is a metasearch tool for Macintosh computers.
3.6. SEARCH SETTINGS

3.6.31 Top Best Bet Title

Syntax: text

This is the title text of best bets displayed above the search results. Common choices are “Best Bets” and “Suggested Links”. See Using Best Bets 4.16 for more details.

3.6.32 Right Best Bet Title

Syntax: text

The title text of best bets displayed to the right of search results. Common choices are “Best Bets” and “Suggested Links”. See Using Best Bets 4.16 for more details.

3.6.33 Top Best Bet Group

Syntax: choose group from drop-down list

This controls which group of best bets will be shown above the results. The group must already be created. See Using Best Bets 4.16 for more details.

3.6.34 Right Best Bet Group

Syntax: choose group from drop-down list

This controls which group of best bets will be shown to the right of the results. The group must already be created. See Using Best Bets 4.16 for more details.

3.6.35 Top Best Bet Box Color

Syntax: valid HTML color

This controls the color to be used for the background of the top best bet box. See Using Best Bets 4.16 for more details.

3.6.36 Right Best Bet Box Color

Syntax: valid HTML color

This controls the color to be used for the background of the right-side best bet box. See Using Best Bets 4.16 for more details.
3.6.37 Top Best Bet Border Style

Syntax: select from drop-down list

This controls the style of the top best box border. You can choose to have no border, a border around all the best bets, or an individual border around each result. See Using Best Bets 4.16 for more details.

3.6.38 Right Best Bet Border Style

Syntax: select from drop-down list

This controls the style of the right-side best bet border. You can choose to have no border, a border around all the best bets, or an individual border around each result. See Using Best Bets 4.16 for more details.

3.6.39 Right Best Bet Box Width

Syntax: enter number in text box

This controls the width of the best bet boxes shown to the right of the regular search results. See Using Best Bets 4.16 for more details.

3.6.40 Authorization Method

The Authorization Method setting controls what Results Authorization method(s) are used by the Search Appliance when verifying user access to search result URLs. See the Results Authorization section (p. 80) for details. The possible settings are:

- **None**: No access verification; return all search results to all users. This is the default. It is also the setting that should be used for a Meta Search profile, even if one or more of its back-end profiles does use Results Authorization: the request and response for credentials will automatically be passed back and forth from front-end Meta Search to back-end profiles, which will handle the authorization (not the front-end).

- **Forward login cookies**: The Search Appliance will forward login cookies from the user to the result URL. This is for custom HTML-form-based single-sign-on systems.

- **Basic/NTLM/file - prompt via form**: The Search Appliance will prompt the user for their credentials with a form, then send them to the result URL via HTTP Basic, NTLM or Windows/SMB file authentication.

3.6.41 Login Cookies

For the Forward login cookies Results Authorization method, one or more cookies must be named in the Login Cookies setting. No values are given, as they will be obtained automatically on a per-search basis from the user.
When a user conducts a search, if the named cookies are seen from the user’s browser, the user is assumed to be logged in, and the cookies are forwarded to the results URLs for authorization. If the named cookies are not seen, the user is assumed not to have logged in yet, and is redirected to Login URL instead.

### 3.6.42 Login URL

For the Forward login cookies Results Authorization method, if none of the Login Cookies are seen at search time, the user is assumed not to have logged in yet, and will be redirected to this URL instead. The Login URL should be the URL to the site’s form-based login page.

After logging in, the site’s login page can be configured to re-direct the user back to their original search if desired. The special token “%REFERER%”, if used in the Login URL, will be replaced with the URL back to the user’s search. Thus, it could be assigned to a query-string variable in the Login URL so that the login page can redirect back to the search. E.g. with this value for the Login URL:

```
http://login.acme.com/login.asp?searchurl=%REFERER%
```

the Search Appliance would redirect the user to `http://login.acme.com/login.asp`, with the searchurl variable set to the Search Appliance search page (with query). The login.asp code could be modified to redirect the user back to the searchurl query variable after login.

### 3.6.43 Basic/NTLM/file Cookie Type

For the Basic/NTLM/file - prompt via form Results Authorization method, this setting controls what cookie type to use for the Search Appliance’s copy of the user’s credentials.

With Basic/NTLM/file - prompt via form set, when a user conducts a search for the first time, a form is presented (from the Search Appliance) asking for a user and password. The user/pass is sent back to the user as a cookie from the Search Appliance for use in future searches without having to re-prompt. The user/pass is also simultaneously used to validate search results via HTTP Basic/NTLM or Windows/SMB file access.

The Basic/NTLM/file Cookie Type setting controls whether this cookie from the Search Appliance should be Persistent (retained permanently so the user does not have to login again) or Session (discarded after browser closure for security).

Note that the Basic/NTLM/file Cookie Type cookie is distinct from the Login Cookies; they are used for different access methods. The former originates from the Search Appliance and is only ever sent to/from the user and the Search Appliance: non-cookie-based access methods are then used from the Search Appliance to the result URLs for actual authentication. Login Cookies, however, originate from a third-party form-based login system, and pass from the login server to the user to the Search Appliance to the result URLs.
### 3.6.44 Login Verification URL

For the Basic/NTLM/file – prompt via form Results Authorization method, the user is directly prompted for a login by the Search Appliance. Since authentication is handled by another server, when search results are denied access, the Search Appliance cannot know if the denial is URL-based (lack of access by the user), or login-based (mistyped/wrong password).

To differentiate the two and give users a chance to correct mistyped passwords, a Login Verification URL may be set. This should be a URL that all users have access to, but that is still protected (i.e. anonymous users are denied). It should be an actual file (not a directory), preferably small (a few KB), and permanent (not likely to move, be renamed or have perms changed).

If Login Verification URL is set, the Search Appliance will verify a user’s prompted-for login by accessing this page. Since all users have access to it, a denial is assumed to mean the login was incorrect, and the user will be re-prompted for their credentials. Without a Login Verification URL set, a mistyped password will result in no search results, but the user will not know if they do not have access to the results, or they merely mistyped their password.

### 3.6.45 Unauthorized Result Query

For all Authorization Method types of Results Authorization, it is assumed a protocol-level denial will be issued when the Search Appliance accesses URL(s) that a user does not have access too. E.g. for HTTP URLs, a 401 Unauthorized message should be issued.

However, some servers may only issue a human-readable denial message, but otherwise return an ok (e.g. HTTP 200) protocol message. For such results the Search Appliance will assume the user has access, and will erroneously return the result.

To remedy this, Unauthorized Result Query may be set to a query that will match only denied pages (e.g. “Access Denied”). The Field/Type box should be set to the query type (substring vs. REX) and field (raw HTML vs. formatted text) for the search. The Query field is set to the actual substring or REX query.

Note that this setting imposes an extra search load, as each search result must be verified with a full-page GET instead of a HEAD, as well as queried against. Thus, Unauthorized Result Query should only be set if absolutely necessary.

### 3.6.46 Username Fixup

Username Fixup allows you to make modifications to the Results Authorization username provided, such as adding or removing a domain. This allows multiple back-ends with slightly different authentication schemes to be searched simultaneously in a Meta Search.

- **Search** - the search expression to match on the incoming username. Unless you’re stripping off a domain, this should be left blank to match everything.
3.6. **SEARCH SETTINGS**

- **Replace** - the replacement string used to modify what was matched in the search. Please see examples below, or the **Replacement Strings** section of the Vortex manual on our website for the exact syntax.

For example, suppose you have a wiki and a file server. They use the same authentication back-ends, but the wiki takes the format username and the file server takes the format DOMAIN/username. If you create a profile for each of them and set the **Username Fixup Replace** value for the file server to DOMAIN/\1, then you can meta-search both with username and each will get the format it needs.

**Examples**

- **Changing username to MYDOMAIN/username**
  - Search - *(Empty)*
  - Replace - MYDOMAIN/\1

- **Changing MYDOMAIN/username to username**
  - Search - >>=!/+/=.+
  - Replace - \4

- **Changing MYDOMAIN/username to OTHERDOMAIN/username**
  - Search - >>=!/+/=.+
  - Replace - OTHERDOMAIN/\4

### 3.6.47 Max Docs to Auth-Check

This setting is the maximum number of raw (pre-auth-check) search result URLs to examine for authorized results, during results authorization. Decreasing this limit can speed up searches and reduce origin server load, at the cost of possibly truncated displayed results. E.g. noisy queries that match many overall documents on the server, but few of which are authorized for the search user, may use a lot of server resources, so reducing this limit may reduce that load.

The maximum value is -1 or blank (the default), for no limit: i.e. continue until all results are checked, or **Successful Auth Result Limit** or **Total Auth Timeout** is reached.

### 3.6.48 Successful Auth Result Limit

This setting is the maximum number of authorized (displayable, post-auth-check) results to try to establish, during results authorization. Increasing this limit makes it more likely to get an exact hit count for a search (instead of a single page), at the expense of more search time and more origin server load.

The minimum (and default if empty) is the same as the **Results per Page** setting (p. 59), which produces a page of results the fastest. The maximum is -1 for no limit, i.e. continue until all results are checked, or **Max Docs to Auth-Check** or **Total Auth Timeout** is reached.
3.6.49 Total Auth Timeout

This setting is the maximum total time in seconds to spend searching and authorizing results, during Results Authorization. The maximum setting value is -1 for no limit, i.e. let Search Timeout (p. 73) cancel the search if reached. Any other negative value is relative to Search Timeout. Thus the default (if empty) of -5 means stop searching 5 seconds before Search Timeout, so that there are a few seconds left to send the results to the user.

3.6.50 Allow Authorization URL

If enabled, the Authorization URL field of each document is used for Results Authorization instead of the document URL. (If the Authorization URL field of a document is empty, or this setting is disabled, the document URL is used.) Enabling this can speed up searches under certain circumstances.

Sometimes an entire group of documents share the same authorization. For example, on some systems the contents of a directory always have the same authorization as the directory itself. In other words, every user’s permissions on the files in any directory is the same as their permissions on the directory itself. If this is the case, then Results Authorization can authorize all results in the directory just by authorizing the directory itself, once. This reduction in calls speeds up searches.

For this optimization to be effective, the Authorization URL field in the database must be populated (see Data from Field, p. 33). For example, on systems where the contents of a directory always have the same authorization as the directory itself, Authorization URL should be set to the parent dir of each URL. The more files there are (on average) in a given directory, the more effective this optimization will be. Additionally, the Authorization Caching setting should be set to Session, so that the one-time directory authorization can be reused for each result inside the directory. (Otherwise Results Authorization must repeat the directory authorization for every result in the directory, as normal.)

The Authorization URL field may also be used on systems that do not meet the group-authorization criteria (many docs sharing the same authorization) detailed above. An environment may exist where the crawled/result URL is simply not the same URL that should be used for Results Authorization. For example, the crawl/result URLs may be file:// URLs, yet the authorization should take place with http:// URLs of the same host and path. In such a case, the Authorization URL field could be populated with the http:// variant to tell Results Authorization to use those URLs. In this instance, the field is being used to properly authorize URLs, and will not necessarily speed up searches (because the Authorization URLs are unique and not shared across groups).

3.6.51 Authorization Caching

Whether and how to cache Results Authorization traffic. The default of None does no caching. When set to Session, Results Authorization traffic is cached for the duration of the session, i.e. that search alone. Normally caching is of little benefit, because authorization URLs are typically the same as result URLs, and the latter are typically unique in a given search; thus caching will not help. However, if the Authorization URL field is populated, and Allow Authorization URL is enabled, enabling caching may speed up Results Authorization searches. See Allow Authorization URL (p. 68) for details.
3.6.52 Debug Results Authorization

Enabling this setting causes copious debugging information to be logged. It should only be enabled at the request of Tech Support for diagnosing Results Authorization problems.

3.6.53 Show Authorization Info

Enabling this causes details about the ResAuth process to be displayed on the search results page - which URL are being attempted, what the outcome is, how long it takes, etc. This can assist in troubleshooting why results aren’t displaying when expected.

- None (*default*) - No information is displayed.
- Admin Users Only - information is displayed only if the browser is currently logged in to the admin interface. This allows admins to troubleshoot ResAuth without exposing information to all users.
- All Users - information is displayed for all search users.

**WARNING** - The information shown includes info about URLs that search users don’t have access to (explaining how/why they failed). The Search Appliance acknowledging the existence of these URLs when they’re unauthorized could be considered a security breach in some scenarios.

It is recommended to only set it to Admin Users Only when troubleshooting, and then set it back to None when no longer needed.

3.6.54 Enable Spell Check

Syntax: select Yes or No button

This turns on the spell check option. With this option on, any search which produces no results displays a list of alternate-spelling queries, which will produce more results. If a query produces one result, the Search Appliance suggests other words similar in spelling to the words you entered. The suggestions are based on the actual walk database, so unusual spellings or terminology used on your site are picked up by the spell-checker. The number of suggestions varies, depending on the Suggest Time Limit and Number of Suggestions options. The default is on.

3.6.55 Suggest Time Limit

Syntax: choose from drop-down list

This controls the number of seconds the Search Appliance allows for spelling suggestions to be made. See also Enable Spell Check 3.6.54 for more information.
3.6.56 Number of Suggestions

Syntax: choose from drop-down list

This controls the number of spelling suggestions offered. See also Enable Spell Check 3.6.54 for more information.

3.6.57 Synonyms

Syntax: choose from drop-down list

This allows you to select a level of equivalence matching. You can limit results to specific matches, or you can allow synonyms and phrases. The values are described as follows:

Disabled: no phrase recognition and no synonyms (equivalences). Only searches for the the actual terms in a query. This is regardless of ~ usage.

Phrase recognition only: recognize query word groups that are known phrases and search for them as phrases.

Phrases & Allow synonyms: phrase recognition plus allows the tilde ( ) operator to match synonyms on specific query terms

Phrases & Use synonyms by default: phrase recognition and matching synonyms on all query terms (tilde to turn off on specific terms).

See also Using the Thesaurus (section 4.3).

3.6.58 Main Thesaurus

Syntax: the symbolic name for the primary thesaurus

Here you can select a main thesaurus. A drop-down list allows you to select one of the thesauri that was defined in Maintenance, Custom Thesaurus.

See also Using the Thesaurus (section 4.3).

3.6.59 Secondary Thesaurus

Syntax: the symbolic name for the secondary thesaurus

Here you can select a secondary thesaurus. A drop-down list allows you to select one of the thesauri that was defined in Maintenance, Custom Thesaurus.

See also Using the Thesaurus (section 4.3).
3.6. SEARCH SETTINGS

3.6.60 Translate Boolean

Syntax: select Yes or No button

Off by default. If on, Boolean keywords and, or, and not in the search query will be translated into set logic.

The Search Appliance uses set logic internally, and this setting translates basic boolean statements into proper set logic automatically. This is a limited translation, and does not support nesting of statements.

For more information on the Search Appliance’s use of set logic, please see the Using Set Logic to Weight Search Items section of the Texis manual on our website.

3.6.61 Allow the @ Operator

Syntax: select Yes or No button

Off by default. If on, allow use of the @ (intersections) operator in queries. Queries with few or no intersections (e.g. @0) may be slower, as they can generate a copious number of hits.

3.6.62 Allow Linear

Syntax: select Yes or No button

Off by default. If on, an all-linear query –one without any indexable “anchor” words– is allowed. A query like “/money #million”, where all the terms use unindexable pattern matchers (REX, NPM or XPM) is an example. Such a query requires a linear search of the entire table, and this can be very slow for a table of significant size.

If allinear is off, all queries must have at least one term that can be resolved with the Metamorph index, and a Metamorph index must exist on the field. Under such circumstances, other unindexable terms in the query can generally be resolved quickly, if the “anchor” term limits the linear search to a tiny fraction of the table. The error message “Query would require linear search” may be generated by linear queries if this is off.

3.6.63 Allow NOT Logic

Syntax: select Yes or No button

On by default. If on, allows “NOT” logic (e.g. the – operator) in a query.

3.6.64 Allow Post-Processing

Syntax: select Yes or No button

Off by default. If on, post-processing of queries is allowed when needed after an index lookup, e.g. to resolve unindexable terms like REX expressions, or only partially indexable terms. If off, some queries are
faster, but they may not be as accurate if they aren’t completely resolved. The error message “Query would require post-processing” may be generated by such queries if this is off.

3.6.65 Allow Wildcards

Syntax: select Yes or No button

On by default. If on, wildcards are allowed in queries. Wildcards can slow searches somewhat because potentially many words must be looked for.

3.6.66 Allow Leading Wildcards

Syntax: select Yes or No button

Off by default. If on, leading wildcards (“*word”) are allowed in queries. Allow Wildcards must also be enabled. Note that leading-wildcard terms are significantly slower to search for than trailing-wildcard terms such as “word*”.

3.6.67 Single-Word Wildcards

Syntax: select Yes or No button

On by default. If on, wildcard searches will span only one word in the text – instead of up to 80 characters across words – and will suffix-match. E.g. the query “condition” will match “condition” but not “consider my position” nor “conditionally”.

3.6.68 Allow WITHIN Operators

Syntax: select Yes or No button

Off by default. If on, “within” operators (w/) are allowed. These generally require a post-process to resolve, and therefore they can slow searches. If off, the error message “‘delimiters’ not allowed in query” will be generated if the within operator is used in a query.

3.6.69 Require All Words

Syntax: select Yes or No button

By default, all words a user searches for must be in the result for it to match. If Require All Words is changed to N, a result will be shown if any of the query terms are in the result.

Results that match multiple words will be ranked higher than results that match fewer.
3.6. SEARCH SETTINGS

3.6.70 Resolve Phrase Noise Words

Syntax: select Yes or No button

Off by default. This indicates whether to exactly resolve the noise words in phrases. If on, a phrase such as “state of the art” will only match those exact words; however, this may require post-processing to resolve (potentially slower). If off, any word is permitted in place of the noise words, and no post-processing is needed; this is faster but potentially less accurate.

3.6.71 Keep Noise Words

Syntax: select Yes or No button

Off by default. This indicates whether to keep noise words (Yes) in the query during query processing and search for them, or remove them (No, the default) from the query and ignore them.

3.6.72 Noise List

Syntax: whitespace separated list of noise (stop) words

A list of words to be ignored in queries (if Keep Noise Words is No). If empty the default list will be used, which is:

a about after again ago all almost also always am am an and another any anybody anyhow anyone anything anyway are are as at away back be became because been before being between but by came can cannot come could do does does doing done down each each else even ever every everyone everything every for from front get getting go goes going gone got gotten had has has have having he her here him his how i if in into is isn’t it just last least left less let like make many may maybe me mine mine more most much my my myself never no none not now of off on one onto or ourselves out over per put putting same saw see seen shall shall she she should should so some somebody someone something stand such sure take than that their their them them then there these they this this those through till to too two unless until up upon us us very was we went were were what what’s whatever when where whether which while who who whoever whom whose whose why will will with within without won’t would wouldn’t yet you your

3.6.73 Search Timeout

Syntax: integer number of seconds

This is the maximum overall time to spend searching and sending results. Exceeding this limit, whether due to server load, network slowness, etc. will result in a “Timeout” message to the user. This helps prevent heavy load from overwhelming the server. The default (if empty) is 30 seconds. The maximum is -1 for no limit, which is strongly discouraged.
3.6.74  **Show Error Messages**

Syntax: select box

Show Error Messages determines the disposition of error messages during searches. It may be set to one of the following values:

- **None**
  Suppress all errors

- **In HTML comments**
  Show errors in HTML comments (for HTML result styles) so that they are not normally visible to the user, but can be viewed via View Source in a browser. In XML result styles, errors will be suppressed.

- **In HTML comments & query errors visible**
  Show errors in HTML comments (for HTML result styles), but show query-related errors (e.g. “Your query was all noise words.”) visibly (in grey boxes).

The default is **In HTML comments & query errors visible**. Note that in admin (test search) mode, all errors are always shown visibly, for admin perusal.

3.6.75  **Debug SQL Level**

Syntax: integer number or empty/0 to disable

Setting Debug SQL Level to a non-empty/non-zero value (typically 3) enables extra debug messages for certain SQL statements. Generally only set at the request of tech support for diagnosing problems.

3.6.76  **Fast Result Counts**

Syntax: select Yes or No button

Off by default. Some complex queries involving categories or proximities closer than page can take more time to determine exact result hit counts. In some cases it may cause timeouts. Enabling this option will determine hit counts much faster, and using less CPU, in these cases at the expense of accuracy. The hit counts for complex queries will generally be overestimated (it will say there are more hits than there really are).

3.6.77  **Proximity**

Syntax: choose from drop-down list

Proximity gives the ability to locate answers with greater precision. The Search Appliance input form gives you several options to control the search proximity:

**line**  All query terms must occur on the same line
3.6. SEARCH SETTINGS

sentence  Query items must all reside within the same sentence

paragraph  Within the same paragraph or text block

page  All items must occur within same HTML document (the default)

A bar-graph display will be shown any time a ranking search was performed (e.g. all searches except Show Parents).

3.6.78  Language Characters

Syntax: list or range of characters, as inside REX [ ]

The Language Characters setting controls what characters constitute a language query. Query terms composed entirely of these characters are considered language terms, and have Word Forms processing applied. The syntax is a list of characters (no separation), and/or a range of characters; the same as a REX character class (without the brackets). The default is \alpha\'{\x80-\xFF}, i.e. alphabetic, hi-bit (for UTF-8) and apostrophe (for contractions). For best results, all characters that could match part of a Word Definition expression (p. 42) should usually also be listed in Language Characters.

3.6.79  Word Forms

Syntax: choose from drop-down list

The Word forms options give you control over how many variations of your query terms are sought in your search as follows:

Exact:  Only exact matches are allowed. (the default)

Plural & possessives:  Plural and possessive forms are found. (s, es, ’s)

Any word forms:  As many word forms as can be derived are located.

Custom:  use the three custom settings below to determine word forms.

3.6.80  Custom Suffix List

Syntax: Space-separated list of suffixes

When using the Word Forms Custom, this is the space-separated list of suffixes to use. All of these will be repeatedly stripped off of words, as long as the word is longer than the Custom Suffix Min Length.

An example setting could be s es ’ a e i y. For the word smith’s, the sand ’ would be stripped, causing it to match smith, smiths, etc.
3.6.81 Custom Suffix Default Removal

Syntax: Y or N

When using the Word Forms Custom, this controls whether to remove a trailing vowel, or one of a trailing double consonant pair, after normal suffix processing is finished. This will not apply if it would take the word below the minimum word length.

For example, if ing is in the suffix list and Default Removal is Y, then the word running will have the ing stripped, and then the 2nd n will be removed via Default Removal, producing run.

Default Removal is set to Y when using Plurals & Possessives and Any Word Forms.

3.6.82 Custom Suffix Min Length

Syntax: Number

When using the Word Forms Custom, the Search Appliance will not try to strip additional suffixes from any word shorter than this length. For example, if min length is 3 or more, the es on yes will not be treated as a suffix.

Min Length is set to 3 when using Plurals & Possessives, and 5 for All Word Forms.

3.6.83 Word Ordering

Syntax: choose from drop-down list

Controls how important word order is for results ranking: hits with terms in the same order as the query are considered better. For example, if searching for “bear arms”, then the hit “arm bears”, while matching both terms, is probably not as good as an in-order match. The default weight is Medium (500).

3.6.84 Word Proximity

Syntax: choose from drop-down list

Controls how important proximity of terms is for results ranking. The closer the hit’s terms are grouped together, the better the rank. The default weight is 500.

3.6.85 Database Frequency

Syntax: choose from drop-down list

Controls how important frequency in the table is for results ranking. The more a term occurs in the table being searched, the worse its rank. Terms that occur in many documents are usually less relevant than rare terms. For example, in a web-walk database the word “HTML” is likely to occur in most documents: it thus has little use in finding a specific document. The default weight is 500.
3.6. Document Frequency

Syntax: choose from drop down list

Controls how important frequency in document is for results ranking. The more occurrences of a term in a document, the better its rank, up to a point. The default weight is 500.

3.6.87 Position in Text

Syntax: choose from drop down list

Controls how important closeness to document start is for results ranking. Hits closer to the top of the document are considered better. The default weight is 500.

3.6.88 Clicks from Home

Syntax: choose from drop down list

Controls how important being close to a Base URL is for results ranking. The more times the walk had to click on links to get to the page, the lower weight it will have. The default weight is off, i.e. do not factor in clicks-from-home for results ranking.

3.6.89 Ranked Rows

Syntax: number

The maximum number of rows that can be scrolled to when returning ranked results. This can be set to 0 for all matching rows, or to any other number. The lower the number the better the performance, however users won’t be able to scroll through as many results. The default is 200.

3.6.90 XML Export Variables

Syntax: names separated by newlines

XML Export Variables is a list of variables, one per line, that are to be displayed and propagated through XML search results. For example, if cbtGroup is specified in XML Export Variables, and the search query includes ...&cbtGroup=use...then the following block will appear in XML output, after all the <Result> tags:

```xml
<exportVar>
  <variable name="cbtGroup">user</variable>
  <variable name="cbtGroup">backup</variable>
</exportVar>
```

This setting only applies if Results Style is set to XSL Stylesheet.
3.6.91 File URL Format

Syntax: choose from drop down list

Controls how file URLs are formatted. The Max Compatibility setting will format them as
file:///server/share which both Internet Explorer and Mozilla-based browsers such as Firefox
and SeaMonkey support, while the Internet Explorer only setting will format them as
file://server/share.

Note that for Mozilla-based browsers you will also need to enable permission for HTML pages to open files
by creating a user.js in your profiles directory (where prefs.js is) that contains (note: lines wrapped
to fit the printed page):

```javascript
user_pref("capability.policy.policynames", "localfilelinks");
user_pref("capability.policy.localfilelinks.sites", 
    "http://HOSTNAME");
user_pref("capability.policy.localfilelinks.checkloaduri.enabled", 
    "allAccess");
```

where HOSTNAME is the name or IP address of the search results as seen in the browser address bar.

3.6.92 Redirect Format

Syntax: choose from drop down list

Controls how redirects are presented when doing Query Logging, as some combination of HTTP 302
redirects and HTML meta-refresh redirects.

The Max Compatibility setting is recommended, which works around known bugs in Internet
Explorer by not using a 302 redirect when Internet Explorer is requesting file:// URLs.

3.6.93 Phishing Protection

Phishing Protection prevents the Search Appliance from being used as a tool in a phishing attack.

The Search Appliance has a redirect page as part of its Query Logging functionality, where it will provide a
redirect to the URL specified. It would be possible for an attacker to specify a URL that, at first glance,
looks like a link from the Search Appliance, which the user may trust. After the redirect, it actually ends up
somewhere else.

If Phishing Protection is enabled, the redirect page will make sure that any URL specified is actually in the
profile’s walk database before issuing the redirect to it.

3.6.94 Decode Displayed URLs

Decode Displayed URLs will cause the URL that is displayed in search results to be URL-decoded, which
includes replacing sequences with their proper characters.
This can be useful when URLs have words separated with spaces, which are replaced with \%20 to be a valid URL. Decode Displayed URLs allows you to display the decoded version, making the files easier for search users to read.
"this%20is%20a%0file.txt" becomes "this is a file.txt".

3.6.95 Results Caching

The Results Caching option can be used to enable a search results cache mechanism, which can speed up response time for frequently-used queries. When enabled, the HTML or XML results of searches are stored in a per-profile cache, and if a later search is made with the same query string parameters, the cache result may be returned, avoiding the need for a full search. Setting Enabled to Y enables results caching.

Setting Allow Override to Y allows users to control whether a search uses and/or updates the cache, by specifying a value for the rescache query string variable:

- n - Do not search or refresh the cache; i.e. search as if caching were disabled.
- refresh - Do not search the cache, but update it if rules allow.
- norefresh - Search the cache, but do not update it.
- y - Search and update the cache normally.

Both Enabled and Allow Override are considered “appearance” options, i.e. they will not take effect for Live Search unless Update Live and Test is used. See the Results Caching section of Profile Tools (p. 15) for more details on when to use results caching, its caveats and management.

3.6.96 Max Cache Entry Age

This sets the maximum age, in seconds, for a results cache entry. Entries older than this will not be used for results, and will be purged by the results cache manager. The default (if empty) is 21600 seconds, i.e. six hours.

3.6.97 Max Cache Size

This sets the maximum size, in bytes, of the results cache. This is not a hard limit, but when the cache grows larger than this, the results cache manager will start to remove old/low-priority entries. The default (if empty) is 100000000 (one hundred million bytes).

3.6.98 Min Search Time

This sets the minimum search time, in seconds, that a query must take in order to be considered for results caching. Queries that are faster than this are not cached, because they are considered fast enough to save the space. The value may be an integer or floating-point (decimal) number; the default (if empty) is 2.0.
3.6.99 Visible

This controls whether this profile is visible to other Search Appliances (or even the same one) for use in a meta search. Any profile that is to be used as a part of a meta search must have the Visible flag set to Y.

If a profile has Visible set to N and is used as a back-end for meta search, it will return the error Profile not Visible.

3.7 Results Authorization

Results Authorization allows restriction of search results to authorized users only, on a per-URL basis. Only users with access to a given URL will ever see that URL in a result list, instead of all users seeing all matches (and potentially being denied access to results already shown).

Access to a URL, as well as the namespace of users, is determined by the URL’s origin server, not the Search Appliance, so no reconfiguration of users or access is needed – the pre-existing server access controls are just forwarded by the Search Appliance. And since access is determined on a per-result, not per-search, basis, a single profile can serve a multitude of users with any combination of whole/partial access to the underlying data.

Results Authorization works at search time (late binding) by accessing each potential search result URL with the user’s credentials. Only URLs authorized to that user are then shown in search results. The authentication method(s) used will depend on the existing system(s) already used by the indexed URLs. Various schemes are supported:

- **None**: No access verification; return all search results to all users. This is the default.

- **Cookie-based**: Custom HTML-form-based single-sign-on systems. Users first login on a web server (not a Windows workstation login), which then sends an access cookie to the user’s browser. This cookie is automatically returned to the server when accessing future pages, and grants the user access.

- **Basic**: HTTP Basic authentication, for web servers.

- **NTLM**: Windows NTLM authentication, for web servers.

- **SMB/Windows**: SMB for Windows file servers (for Thunderstone products that support file:// crawling).

For cookie-based systems, the Search Appliance will merely forward the cookies the user has already received from the site login page. For all others (Basic/NTLM/SMB), the Search Appliance must prompt for the user and password directly, as they are needed to verify result URLs. In the latter case, credentials will then be stored in a cookie by the Search Appliance so that future searches do not need to re-prompt for a login. Note that NFS-mounted file servers are not currently supported by Results Authorization, due to limitations of NFS.
3.8. Meta Search - Search multiple profiles as one

3.8.1 Profile Creation

When creating a profile, change the Standard select box to Meta Search instead.

3.8.2 Meta Search Walk Settings

Walk Settings is somewhat of a misnomer for a meta search profile since it doesn’t do any walking of it’s own. On this page you list the host(s) and profile(s) to search and merge when this profile is accessed.

For each profile you want included in the search you list the profile’s name in the Profile Name column and the host name or IP of the machine where that profile resides in the Host IP or Name column. You may use DNS resolvable names or IP addresses in the host column. IP addresses are slightly more efficient because they don’t require DNS lookup. But names are more flexible. Only the DNS, not a bunch of profile settings, has to change when machines get replaced or renumbered.
The Display Name column is used to provide a user friendly name for this profile that will be displayed if the user is allowed to choose which profiles to search.

The Status column shows the status of the remote profile once a host/profile has been entered and Update has been pressed. If the target is searchable, OK is displayed. Otherwise, text explaining the error is displayed. Refreshing the page re-queries the target profiles.

If User Selection is set to Y then the user will be presented with a list of Display Names and can choose which ones to search. Leaving them all unchecked will cause them all to be searched.

The Meta Mode setting controls whether profiles on the same host will be searched serially or in parallel. “Sameness” of host is determined by the Host IP or Name setting, so using different names or a name and an IP address will allow you to mix serial and parallel.

The Results Merge Method setting controls how target profiles’ results are merged and sorted by the meta profile. Two methods are available:

- Requested order
  The results will be sorted as requested, i.e. as specified by the order query-string variable (or if that is unset, the meta search Result Order search setting). This is the default. Thus, results from different target profiles may or may not be mixed together (depending on how they sort by order).

- Target profile order
  The results will be sorted by their Profiles setting order first, then by requested (order variable) order. This will result in all results of the first target profile being shown first, then all results of the next target profile, etc.

Note that in both cases, the target profiles still individually sort their results according to requested order. The Results Merge Method setting only affects how those top results are then merged and sorted by the meta profile.

All servers with profiles listed as targets of a meta search must have the IP address of that meta search server listed in the Cluster Members setting under Maintenance->System Wide Settings. Otherwise meta searches will return the error “Profile not Visible”.

3.8.3 Search Settings

The appearance options control the appearance of the meta search results pages. Currently the Results Authorization and query options of the meta profile do not apply: use the target profiles’ options instead.

When using best bets the meta search profile must have the same group names as the backend profiles. Any best bets from the backends that have group names that are not defined in the meta profile will not be shown.

Query logging of the meta search and the backends are independent of each other. The meta search will respect its own query logging setting as will each of the backend profiles. So it is possible to have multiple logs for the same query if both the meta search and the backend have query logging turned on.
3.9 Access Control

Access Control allows different administrative users to be given different levels of access to the Search Appliance; normally, with access control off (the default) all users have access to all administrative functions. Access Control can only be enabled or disabled by the admin user, on the Maintenance page.

3.9.1 User Groups

User groups allow easier access control maintenance, as users with similar permissions can be administered together once rather than separately several times. The special group Everyone always exists and cannot be edited; it always contains all users as a convenience.

User groups may contain other groups as well as users, allowing complex hierarchies to be created if needed. Permissions for a user are affected by all groups a user is directly or indirectly a member of. For example, if user Amy is in group Programmers, and group Programmers is in group IT, then Amy is also indirectly a member of IT, and her permissions are affected by those granted to not only herself and Programmers but IT as well.

3.9.2 Object hierarchy

Each administrative action that can be access-controlled (e.g. editing walk settings, creating accounts) can be thought of as an object. Some actions are broader than others and can be thought of as a superset, e.g. editing all profiles is a superset of editing a specific profile. Thus, access control objects are arranged in a tree-like hierarchy, where each object has a parent object, and can inherit permissions from it. This makes setting privileges on a logical group of objects (e.g. all profiles) easier, as only one object may need to be changed (the parent). Also, when new child members (e.g. new profiles) are created, they will inherit the
same privileges automatically. The access control object hierarchy in the Search Appliance is as follows:

/                        Global root object
  Users/                  User accounts
    admin                 admin user
    ...                   Other users
  Groups/                 User groups
  Profiles/               Profiles
    default               default profile
    ...                   other profiles
  Settings/               Profile settings
  Maintenance/            Maintenance page
    Info/                 
    Updates/              
    Logs/                 
    Settings/             
      System Wide
      ACLs
      Thesaurus
      Save, Restore
      Mounts
    System/               
      RAID

Note that these “files” do not really exist: the objects are merely symbols representing actions that can be access-controlled.

### 3.9.3 Access Control Lists

An object may have an Access Control List (ACL) associated with it. ACLs determine what rights (Read/Write/Delete/Change perms) users have on objects. Each object’s ACL contains one or more Access Control Entries (ACEs). An ACE identifies a trustee (a user or group), a set of rights, and whether those rights are allowed or denied the trustee on that object. In addition to the ACL explicitly set on an object, rights may be inherited from parent objects’ ACLs, as mentioned above.

### 3.9.4 Determining Effective Rights

The effective rights a specific user has on an object – what the user can actually do with the object – are determined by examining ACEs in a specific order. The first ACE that matches both the user and the desired access right determines whether the user has that right on the object. An ACE matches the user if it specifies the user or any group the user is directly or indirectly a member of. An ACE matches the desired right if the right is listed in the ACE.

ACEs are examined in the following order¹:

¹In versions 5.3.0 and earlier, deny ACEs were always required to be before allow ACEs for an object.
3.9. **ACCESS CONTROL**

1. ACEs explicitly set on the object
2. ACEs explicitly set on the object’s parent
3. ACEs explicitly set on the object’s further ancestors, nearest ancestor first

At each object, ACEs are checked in ACL order (the order displayed for an object on the Access Control page). Order can be changed among multiple ACEs on the same object by using the up arrow and down arrow buttons next to the ACEs.

If no matching ACE is found after all levels are examined (back to the root or Global ACE), access is allowed by default (this is for back-compatibility with non-ACL mode).

### 3.9.5 Required Rights for Admin Actions

Certain ACL rights are required for certain administrative actions to be performed. In order to maximize rights-configuration flexibility, some actions require rights on multiple objects. For example, editing settings on a profile requires rights not only on the profile, but also on the setting itself. Note in the object hierarchy (p. 84) that profiles and settings are two “sibling” branches, rather than settings being replicated as descendants of every profile. Thus, profiles and settings can be thought of as a two-dimensional grid for permissions, and a user’s rights can be tailored across that grid: access to one setting across all profiles, access to all settings one profile only, etc.

The rights needed for specific actions are listed below. If a user does not have the required rights for an action, either a red Access denied message will be displayed, or (if access still granted to other parts) the affected object may simply not appear (read access denied), or may appear grayed out (write access denied). For more information and some example permission schemes, see the Using Access Control section, p. 121.

**Walk and Search Settings**

For settings under Basic, All Walk, and Search Settings, a user must have read access to the profile as well as read access to the specific setting in order to see the setting. Write access to the profile, and write and delete access to the setting, is needed in order to modify a setting. (Delete is needed to clear a setting, which may not be apparent from the form.) Note that some settings are grouped on a line, such as the Enterprise setting: permissions can be granted to the group as a whole (Enterprise), or only specific settings in the group (Enterprise - Yes or Enterprise - Domain). If a user has no read access to a setting, it will not be displayed on the page. If a user has no write access to a setting, it will be disabled (grayed out and not modifiable).

**Starting and stopping a walk**

Write access to the profile and write access to the Walk now setting is required to start a walk. Write access to the profile and write access to the Stop walk setting is required to stop a walk.
**Best Bets**

Write access to the profile and write access to the Best Bet Groups setting is needed to modify the Best Bet Groups for a profile, or to modify Best Bet words for a specific URL (under List/Edit URLs). Note that this is distinct from editing Best Bet search settings (e.g. Top Best Bet Title), which only affect search, not the walk itself.

**List/Edit URLs**

Write access to the profile and write access to the List/Edit URLs setting is needed to modify URLs in the database, including using the Update Soon link. Read access to both is needed to view URLs.

**List Duplicates**

Read access to the profile and read access to the List Duplicates setting is needed to read the error table and list the duplicates of a URL.

**Walk Status**

Read access to the profile and read access to the Walk status setting is needed to view Walk Status.

**Query Log**

Read access to the profile and read access to the Query log setting is needed to view the Query Log.

**Profiles**

Read access to the profile and read access to the desired setting(s) are needed to view the given setting. Write access to both is needed to modify a setting. Delete access to the profile is needed to delete the profile. Write access to All Profiles (the parent of profiles) is needed to create a new profile.

**Accounts**

Write access to All Users is needed to create a new user. Write access to the user is needed to change the password for a user. Delete access to the user is needed to delete a user.

**User Groups**

Write access to All Groups is needed to create a new group. Write access to the group, as well as write access to each member being added or removed, is needed to add or remove members to or from a group.
(except where the group is only indirectly being modified due to a member itself being deleted). Delete access to the group is needed to delete a group.

**Access Control**

Change-perms access to an object is needed in order to create, edit or delete an ACE on the object.

**Maintenance**

Read access to `Info` under `Maintenance` is needed to read the Information links. Write access to `Updates` under `Maintenance` is needed to install or upgrade software. Read access to `Logs` under `Maintenance` is needed to read the Logs links. Write access is needed to `Kill` in order to kill processes. Write access to `Settings` under `Maintenance` is needed to modify Settings, *with the exception of* Enable or Disable Access Control Lists: these can only and always be performed by the `admin` user, *regardless of* ACLs (e.g. for emergency reset). **Note:** giving a user write perms on `Settings`, directly or indirectly, can allow them to override anything on the system, e.g. via externally-modified save and restore settings. Also, note that a user with physical access to the machine could overwrite settings, e.g. re-install the software.

### 3.10 Running the Search Interface

See section 4.1, p. 107.
3.11 Maintenance

The Maintenance menu has the following structure. Each item is described in the pages that follow.

Information
- Display Disk Space
- System Information
- Thunderstone Information
- Tech Support Information
- Extra Downloads

Install/Upgrade
- Setup/edit update preferences
- Check for updates
- Install from CD

Logs
- Manage logs (View, Delete, Rotate, Send)
- View Data Import Log

System Settings
- System Wide Settings
- View/Edit Access Control Lists
- Enable or Disable Access Control Lists
- Custom Thesaurus
- Manage SSL/HTTPS Server Certificates
- Save Appliance settings
- Restore Appliance settings
- Network Filesystems & Shares
- DBWalker Settings / Status
- Manage Google Connectors
- Test Network and Servers

Appliance system access
- RAID Array Management
- Advanced Support Tools
- Webmin Interface

3.11.1 Information

The Information group provides links to a variety of information useful for monitoring the system and performing maintenance.

Display Disk Space

This page provides disk space information (used and available). It also displays the amount of disk space used by each individual profile.
System Information

This page provides system information including: network IP addresses, MAC address, kernel version, load, and time. It also allows killing of processes owned by the texis user, which includes walks.

Thunderstone Information

This page provides Thunderstone software version numbers, the Search Appliance serial number, Thunderstone contact information, and license information.

Tech Support Information

This page provides a convenient means of communicating your system information to Thunderstone technical support. Click the Email link to automatically send the information.

Extra Downloads

This page provides links to extra software, such as SOAP API examples.

3.11.2 Install/Upgrade

The Install/Upgrade section provides links to pages for installing and upgrading software.

Setup/edit update preferences

This allows you to configure the system to perform updates automatically. There are three steps to performing an upgrade, and you can select how many steps are performed automatically. The steps are described as follows:

- Discover Updates. Discovers whether software that is newer than what is installed is available.
- Download. Obtain newer software from Thunderstone through the Internet.
- Install. Install the downloaded software.

Check for updates

This allows you to manually initiate a check for software updates. It provides a list of available updates, allows you to select which updates to download, and allows you to manually initiate the installation of the downloads.

Refer to Getting Software Updates 4.4 for the procedure to manually perform updates.
CHAPTER 3. OPERATION

Install from CD

This allows you to install the software from a CD.

3.11.3 Logs

The logs provide detailed information about operational events of the database and the system.

Manage logs

This allows you to view, delete, rotate, and email the Search Appliance logs. It lists every file in the log partition and allows you to manipulate each log individually or many at once. Each item has a check box for selection for mass operations, the date and time of last addition, the size, a link to see the most recent bit of that log, and a list of processes currently using that log. Clicking a column header will sort the list by that column.

There may be multiple versions of each log. The version with no numeric extension (.1, .2, etc.) in the filename is the current log. Those with numeric extensions are older logs. Extension .1 is the most recent old log, .2 is the second most recent, etc.. Logs are automatically rotated once a month or once a day if they exceed 10MB. The need for rotation is checked once a day around 4am. To force a rotation check you can click the Rotate Logs button at the top of the manage logs page. If you see a log file with numeric extension that also has process numbers listed in the In Use By column you’ll probably need to reboot the Search Appliance to free up that log file. That should be a rare occurrence, but has been known to happen.

The log listing is divided into sections. The first, unnamed, section is the system level logs. They contain information about the core operating system of the Search Appliance. That’s where hardware, network, and similar events and problems are logged.

The Apache section contains the usage logs for the Apache webserver which is used for HTTPS access to the Search Appliance, if enabled.

The texis section contains logs related to TeXis, the relational database server that is a major technical component of the Search Appliance. These logs provide detailed information about operational events of TeXis.

The webmin section contains usage logs for the Webmin system management interface.

At the bottom of the page is a form which allows you to perform actions on the selected log(s). You may View, Delete, Send, or Download any of the logs. For deleting you will be asked to confirm the deletion before it’s carried out so it should be difficult to delete a log by accident. Deleting logs listed as in use may require rebooting to reclaim their disk space.

For viewing, sending, and downloading you can choose how many lines of the log(s) to see and whether to see the newest lines first (reverse chronological order) or natural order with the oldest lines first.

For sending the logs to Thunderstone technical support you should fill in your email address and a ticket number given to you by Thunderstone. Sending the logs via email assumes that your Search Appliance is
configured to send mail to the Internet. It is by default in the simple case but if you have outbound SMTP blocked by your firewall or need to use a mail relay you’ll need to configure sendmail using the Webmin interface. An alternative to having the Search Appliance email the log is to instead download the log then attach that file to your email to Thunderstone tech support.

**View Data Import Log**

The data import log allows you to see what data has been loaded into the Search Appliance recently. This provides a single view of incoming data, regardless of whether the data came from dataload, replication, Google Feeds, or Google Connectors. This does not include content that was crawled by the Search Appliance, only data that was pushed in from outside sources (which can be harder to “track down”).

**3.11.4 System Settings**

This area is for settings that affect the Search Appliance as a whole and/or may be shared by multiple walk profiles.

**System Wide Settings**

**Home Page**

By default when the Search Appliance is directly accessed, as in `http://hostname_or_ip` it will present a page that allows selection of the admin or search interface. This option allows you to replace that page with any html you devise. The html you upload should refer to images and such using fully qualified URLs because they can not be uploaded to the Search Appliance for use in relative URLs.

Checking Default will revert the Search Appliance home page to its factory behavior.

**Enter At Search, Default Profile**

By default users accessing the Search Appliance using no particular URL will be given a choice of admin or search. Enabling this option removes that choice and enters at the search for the profile named in the Default Profile setting.

**Favicon.ico**

The Search Appliance comes with no favicon.ico file. If you wish users’ browsers to display your company’s favicon when they are accessing the Search Appliance you’ll need to upload that icon. If you no longer wish to have a favicon check Delete.

**Robots.txt**

The Search Appliance comes with no robots.txt file. If you want to control how web crawling robots visit your search pages you can upload a robots.txt file. This robots.txt file will apply to all pages returned by the Search Appliance including admin, documentation, and searches whether accessed by HTTP or HTTPS. See [http://www.robotstxt.org](http://www.robotstxt.org) for the syntax of robots.txt files.

If you no longer wish to have a robots.txt check Delete.
Note: You may also control robots for searches on a profile by profile basis by using meta robots within the top html of the search settings or the custom XSL if you’re using an XSL style sheet for search results. See http://www.roboottxt.org for the syntax of the meta robots tag.

Cluster Members
This field defines the machine(s) and/or network(s) that constitute a cluster of Search Appliances. If you have more than one, all of their IPs or a network prefix and wildcard (such as 10.10.10.*) should be specified here. All machines matching these IPs will be allowed full access to the Search Appliance internals without verification. This allows for replication and meta searching.

API Logging
Allows you to record the XML requests & responses of all dataload and SOAP admin API calls to api.log in the logs directory. This can be useful when troubleshooting why dataload requests aren’t storing properly.

Dataload and replication are supported in the full Texit product, but not Webinator-only.

Task Monitor Logging
Controls the verbosity of logging for the Task Monitor. Messages are logged to taskmonitor.log in the logs directory.

Google Connector Logging
Controls the verbosity of logging for the processing of Google Connectors. Messages are logged to gcon.log in the logs directory. This includes Google Feed pushes, and full connector actions.

Disable All Walks
When this setting is on, no walks will launch for any profiles for any reason (manual, schedule, etc). Setting to Y will stop ALL profiles from walking, overriding any individual profile’s Disable Walks setting.

This can be useful with machines that should be dataload-only, or for machines that want to guarantee their content won’t change.

Log All Replication
Writes information for each replication queue processor to replication.log. This forces logging for all profiles, and also for non-profile, System data replication.

If both ”Log All Replication” and a profile’s ”Log Replication” are set, logging for that profile will be the more verbose of the two.

Enable HTTPS Server
This enables the Search Appliance’s HTTPS web server, allowing web based admin and searches to be accessed via HTTPS in addition to or instead of HTTP. Turn this on to enable encrypted communications. Then access the admin interface using https in the URL instead of http. (Note: this setting was formerly called Enable HTTPS Admin.)

Require HTTPS for Direct Admin
3.11. MAINTENANCE

Set this option to Y so that direct access to the admin interface is only permitted via HTTPS and not HTTP. “Direct” means the immediate, direct connection to the Search Appliance from the web browser (or proxy, if any); security of the earlier hops of proxy-forwarded connections is checked by Require HTTPS for Proxy Admin.

If you use this you must also turn on Enable HTTPS Server.

For safety, Require HTTPS for Direct Admin can only be enabled while accessing the admin interface via HTTPS.

If you have set this option Y and accidentally configure it such that you can not access the Search Appliance, you can re-enable HTTP admin by going to the physical console of the Search Appliance and selecting the drop Admin restrictions (HTTPS,IP,Cipher requirements) option.

(Note: this setting was formerly called Require HTTPS Admin.)

Require HTTPS for Proxy Admin

Set this option to Y so that proxy-forwarded access to the admin interface is only permitted via HTTPS and not HTTP. Forwarded connections are those hop(s) in the connection chain that are forwarded from the client to a proxy (that then accesses the Search Appliance directly); for control of direct connections to the Search Appliance admin (or the direct last-hop from a proxy to the Search Appliance), see Require HTTPS for Direct Admin.

Forwarded connections are checked by examining the X-Forward-Proto header value of connections to the admin interface: if all tokens are https, the forwarded connection is considered secure/HTTPS, otherwise insecure/HTTP. If no X-Forwarded-Proto header is present, the connection is not considered forwarded and this setting does not apply. Note that for this setting to be effective, the network must be secured such that all devices with direct access to the Search Appliance can be trusted to set (or clear) the X-Forwarded-Proto header properly, as the header is easily forged.

For safety, Require HTTPS for Proxy Admin cannot be enabled if you’re currently accessing the Search Appliance via an insecure proxies.

If you have set this option Y and accidentally configure it such that you can not access the Search Appliance, you can re-enable HTTP admin by going to the physical console of the Search Appliance and selecting the drop Admin restrictions (HTTPS,IP,Cipher requirements) option.

Admin Access IPs

This controls what IP addresses are allowed to access the admin interface. You may specify one or more individual IP addresses or networks. Networks may be specified with either address:netmask or address/prefixlen syntaxes. Place each entry on a line by itself. Blank means no IP restriction, the admin interface may be accessed from any IP.
Example. If you have a local class C network of 10.10.1.0 as well as one public IP such as 198.49.220.1 you want to have admin access you would use

10.10.1.0/24
198.49.220.1

or

10.10.1.0:255.255.255.0
198.49.220.1

For safety, The Search Appliance will only accept Admin Access IPs that allow the IP address it’s currently being accessed from.

**HTTPS/SSL Protocols**

Which protocols to allow for HTTPS/SSL connections to the Search Appliance server from remote clients.

Note: `webmin` will only use the first one checked unless all are checked.

For client SSL protocols during crawls, see **SSL Client Protocols** under All Walk Settings.

**HTTPS/SSL Ciphers**

Which ciphers to allow in HTTPS/SSL connections to the Search Appliance server from remote clients.

This uses the `openssl ciphers` command-line format. e.g. turn off low security ciphers with `DEFAULT:!LOW`.

**Enable SNMP service**

This enables the SNMP server on the Search Appliance. With this enabled you can use SNMP monitoring tools to monitor the condition of the Search Appliance.

A few items of particular interest might be

<table>
<thead>
<tr>
<th>What</th>
<th>OID (Object Identifier)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disk space</td>
<td>.1.3.6.1.4.1.2021.9</td>
</tr>
<tr>
<td>System load</td>
<td>.1.3.6.1.4.1.2021.10</td>
</tr>
<tr>
<td>Critical processes</td>
<td>.1.3.6.1.4.1.2021.2</td>
</tr>
</tbody>
</table>

**SNMP Community Name**

This is the community name used to access the SNMP information. We suggest using something unique to your organization rather than "public".

**SNMP Location Value**

This is pretty much anything you want. It has no significance except as a designator for you to identify where or what the Search Appliance is.

**SNMP Contact Value**

This is pretty much anything you want. It would normally contain some contact information for the admins of the Search Appliance.
3.11. MAINTENANCE

SNMP Access IPs

This controls what IP addresses are allowed to access the SNMP interface. You may specify one or more individual IP addresses or networks. Networks may be specified with either address:netmask or address/prefixlen syntaxes. Place each entry on a line by itself. Blank means no IP restriction, the SNMP interface may be accessed from any IP.

Example. If you have a local class C network of 10.10.1.0 as well as one public IP such as 198.49.220.1 you want to have SNMP access you would use

10.10.1.0/24
198.49.220.1

or

10.10.1.0:255.255.255.0
198.49.220.1

Debug Mode

This enables special debug functionality for crawling, searching and/or administration functions. It should be enabled only at the request of Thunderstone tech support, as debug mode can increase CPU and disk space (log) usage. Debug mode is sometimes needed by tech support to diagnose a particular problem. It enables an additional set of alternate URLs for debugging:

<table>
<thead>
<tr>
<th>Normal URL</th>
<th>Debug URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>/texis/dowalk/</td>
<td>/texis/dowalk-debug/</td>
</tr>
<tr>
<td>/texis/search/</td>
<td>/texis/search-debug/</td>
</tr>
</tbody>
</table>

The mode can be set to one of 3 settings:

- **Off** This is the default setting: debugging is off, and debug URLs are disabled.
- **Alternate** Enables debugging for ...-debug URLs only; normal URLs have debugging off. This allows debug testing without disturbing live search.
- **Live** Enables debugging for both ...-debug and normal URLs. This allows debugging of live search, when the situation does not permit changing the URL (e.g. an external URL fetch to the Search Appliance that cannot be altered).

When debugging is enabled, a banner message to that effect is printed at the top of every admin screen, to remind administrators that it is in effect (and should be disabled when debugging is finished).

Administration Interface Options

These settings allow you to tweak the appearance of the pages when you’re working with the Administration Interface. Note that this is the title of the Search Appliance administration pages, such as All Walk Settings, List/Edit URLs, Maintenance, etc., not the titles of the actual search pages, which are controlled in each profile’s Search Settings.
<title> order

By default, the title of administration pages show $profile-$section, where profile is the current profile, and section is the section of the profile being viewed. This setting allows you to swap those to so it shows section first.

<title> max profile length

If the name of the current profile is longer than this number, it will be truncated by ellipses when it displays in the title. This can ensure you will always be able to see both the profile and the section in your page titles.

−1 (default) means don’t truncate, and 0 removes the profile form page titles.

Menu Style

Controls the appearance of the menu on the left side of all pages in the administrative interface. Choose Compact to use a more narrow menu, which gives more room for content when using narrow browsers. All the same links are still presented, and this does not affect search in any way.

Enable/Disable Access Control Lists, View/Edit Access Control Lists

This option turns on/off ACLs for accessing the Search Appliance.

The default permission scheme for managing the Search Appliance is very basic and all accounts have full admin privileges. ACLs allow very fine grained control over which administrators can access which features and settings.

See p. 83 for details about access control lists.

Custom Thesaurus

This area allows you to upload one or more custom thesauri (synonym lists) for use by search profiles. An uploaded thesaurus is compiled and kept on the Search Appliance. There is no way to download a thesaurus once uploaded so it’s a good idea to keep a copy around in case you want to make modifications later on.

Each thesaurus may be used by zero or more profiles and should not be deleted if it is in use by a profile. Search options that affect the use of these thesauri are Synonyms(3.6.57), Main Thesaurus(3.6.58), and Secondary Thesaurus(3.6.59).

See section 4.3 for further details.

Manage SSL/HTTPS Server Certificates

This allows you to manage the server certificates provided by the Search Appliance when serving pages via HTTPS. The admin interface, including webmin, and search will use the same certificate. By default the Search Appliance has a self-signed certificate. If you have multiple hosts you may need to regenerate the self-signed certificate before your browser will allow you to access the second host using HTTPS. If you want to use HTTPS for searches you’ll want to obtain a secure certificate from a trusted authority so that end users don’t get warnings in their browser.
If you’re familiar with requesting and obtaining/creating secure certificates and have a key and certificate pair ready to install you can use the Enter a premade Private Key/Certificate pair option at the top of the Manage SSL/HTTPS Server Certificates page. You will be presented with 3 large input boxes where you can paste in your Private key, Certificate, and an optional Intermediate Certificate that may be provided by your certificate authority.

You can generate a self-signed certificate or a CSR that can be provided to a certificate authority to request a secure certificate by filling in the boxes on the Manage SSL/HTTPS Server Certificates page. If you just want a self-signed certificate to use for encryption but don’t care about authoritative you can check Self sign and enter the number of days you want the certificate to be good for then click the Install Certificate button. If you selected Self sign then you’re finished. Otherwise click the Generate CSR button to generate the CSR.

When generating a CSR you will be presented with a block of text beginning with

-----BEGIN CERTIFICATE REQUEST----- and ending with

-----END CERTIFICATE REQUEST-----. You need to send everything between, and including, those lines to your certificate authority. The certificate authority may ask what type of server you’re using or what format of certificate you need. Tell them you need an apache compatible certificate.

After the certificate authority has confirmed your CSR they will provide a similar but different block of text bracketed with -----BEGIN CERTIFICATE----- and -----END CERTIFICATE----- Paste that entire block, including the BEGIN and END lines, into the New Certificate box. They may also provide an “Intermediate Certificate” that you would need to paste into the New Intermediate Certificate box. If they don’t provide an Intermediate certificate leave the New Intermediate Certificate box empty.

Once you generate a CSR the certificate management page will only present the option of installing the new certificate(s) from that CSR. If you need to regenerate the CSR or want to abandon the old CSR for any reason click the ‘Cancel CSR’ button on the certificate form.

If you have set the Search Appliance to require HTTPS admin and manage to install a certificate that you can’t use or somehow prevents HTTPS access you can re-enable HTTP admin by going to the physical console of the Search Appliance and selecting the drop Admin restrictions (HTTPS,IP,Cipher requirements) option.

Save Appliance Settings

This allows you to save all of the current profile and most of the system settings from the Search Appliance to an XML file on your local workstation. (Mounted filesystems and IP configurations are not currently saved.) This file can be used to aid in cloning Search Appliances for a cluster and as a backup in the event the machine needs to be restored from scratch.

“System-Wide Settings” includes things not specific to a profile - admin logins, system-wide settings, etc. You can choose to download the settings for all profiles, or for some combination of profiles.

Click Download to save a copy of the current settings to your workstation.
**CHAPTER 3. OPERATION**

**Restore Appliance Settings**

Use this option to restore settings that you’ve previously captured using Save Appliance settings.

**Network Filesystems & Shares**

Use this interface to mount remote file server(s) to the Search Appliance so that it may be indexed into one or more walk profiles.

All created mounts are permanent until manually removed. They will be remounted upon reboot of the Search Appliance.

To mount a remote filesystem or share select the type from the drop-down list and click Add.

**NFS file systems - Unix/Linux/etc. servers**

**Server:** Enter the hostname of the server. Case does not matter. (eg: nas1.mycompany.com)

**Directory:** Enter the full path of the directory to mount as it is exported from the server. (eg: /documents/internal)

**Reliability:** Select Hard or Soft. Hard will cause the Search Appliance to keep retrying the same file forever in the event of an error reaching the server. Soft will allow files to fail if the NFS server cannot be reached.

**NFS Version:** The highest NFS version to use. Leave this at 3 unless you have problems with old NFS servers.

**CIFS - Windows 2000+**

**Server:** Enter the hostname of the server. Case does not matter. (eg: nas1.mycompany.com)

**Share:** Enter the name of the share as exported by the server. (eg: internal)

**Login Name:** Enter the login name for the account to use to access the files on this share. This should be a user that has permission to read all the files that need to be indexed.

**Login Password:** Enter the password for the selected login name.

**Server IP:** Rarely used. If the ”Name” of the computer is different than it’s DNS name it may reject mount requests to the ”wrong” name. In that case enter whatever name makes the server happy into the Server field and enter the machine’s IP address into this field.

**NOTE:** When using Windows 2003 server you may need to change a setting on the server to allow mounting from the Search Appliance. If the share won’t mount try setting control panel->admin tools-> domain security policy-> security settings-> local policy-> security options->

Microsoft network server: Digitally sign communications (always) to disabled.

**SMB - Windows**
The SMB - Windows mount is an older system, which has been replaced by CIFS - Windows 2000+. If your file server doesn’t support CIFS or if you’re having problems with CIFS, you can try using SMB instead, which takes the same options as CIFS.

Current mount list

Under the Add form is the list of currently mounts and their status. Each mount has a Remove link to unmount the filesystem and remove it from the list. The options for each mount may be clicked to examine or modify the options and remount the filesystem.

If an entry shows as "unmounted" there is a problem with the settings and it is not able to be mounted as is. If it was a transient problem with the server click the options then click "Save changes" without making any changes to retry the mount.

Under the options for each mount is also an example of the minimum Base URL you would enter into a profile to index the files on that filesystem.

The Technical Info link shows some internal details about the mounts that may be helpful to tech support if you have problems.

Note: This feature appeared in scripts version 5.4.11. Prior to that webmin was the only way to manage remote mounts.

DBWalker Settings / Status

Configuration for the DBWalker module. See p. 131.

Manage Google Connectors

Google Connectors are 3rd party programs that allow you search data from large, complex data data sources (such as Microsoft Sharepoint). There are different connectors for different types of content - Sharepoint, Livelink, File Servers, etc. The connector is installed on a separate server, and the connector machine pulls content from the remote data source, and pushes it into the Search Appliance.

Manage Google Connectors allows you to specify the location of a Connector Manager that’s been installed, using an address like http://otherServer:8080/connector-manager/. You can then instantiate any connectors installed on that Connector Manager, and configure them appropriately (varies by connector).

For more information on Google Connectors, and to download the Connector Manager and connector packages, please visit http://code.google.com/apis/searchappliance/documentation/connectors/

Test Network and Servers

This area provides the ability to test the network connectivity of the Search Appliance and find what web and file server documents look like to it. It is divided into two sections. The first section is for testing Search Appliance fetching and processing of urls. The second section is for testing the Search Appliance’s general network connectivity.
Test URL fetch

First choose the profile whose settings you want to use for the fetch test or choose `-Defaults` for all default settings. If you are currently working in a profile that profile will be automatically pre-selected.

Checkboxes are provided for most of the profile URL settings so you can test those without typing them in. Check as many of those URLs as you want to test.

The input Other URL is also provided so you can test any arbitrary URL. Multiple URLs may be entered separated by space. Be sure to properly encode any entered URL. In particular encode space as `%20`.

Several processing options are provided to control how much processing to do.

- **Full Processing**
  Perform full processing on the fetched file as if it is being prepared for the search database. Otherwise only perform the basic download of the page.

- **Check Robots.txt**
  Consult the site’s robots.txt file to see if the selected URL is acceptable to fetch by the crawler. The test will fetch the URL regardless of robots.txt settings since it’s a single page test not a full crawl.

- **Keep Download**
  Keep the raw undecoded download and decoded data for display. Using this can make the test results page particularly large for large source documents like PDFs etc.

Press Test Page Fetch(es) to begin the testing of the selected URLs.

Each selected URL will be fetched in sequence and results of the fetch(es) presented one after the other on the same page. A short summary will be shown for each fetched URL followed by various statistics and other information about the page. Most of the information is collapsed (hidden) to reduce page clutter. Click the + next to an item to expand that item for viewing. Click the – to recollapse an item. Use the Collapse all and Expand all links to Collapse all items or expand all items respectively. Use Show empty fields to show all fields even if there was no data for them. That helps one determine that a value is actually missing as opposed to overlooked for display.

Large text fields will be shown in scrollable areas by default to avoid taking over the page. Click the + next to a scrolling area to let it fully expand onto the page. Click the – to confine and expanded field.

**Test Network**

There are several network tests available. As many as desired may be done together. Each will be executed in sequence one after the other and the results presented together on one page.

- **Find IP**
  Lookup an IP address for a given host. Options (correspond to walk DNS Mode settings):
  - Internal - Perform the lookup using internal parallelizing routines.
  - System - Perform the lookup using standard system routines.

- **Ping**
Send ping packets to the given hostname or IP address to determine reachability and speed. Check **Gateway** to ping the configured gateway address. A handful of packets will be sent and statistics about each and a summary of response times and loss will be displayed. *Note that not all machines respond to ping and some firewalls block ping. Page fetching may still work even if ping doesn’t.*

- **Traceroute**
  Trace the network route to the given hostname or IP address to determine reachability and spot possible problem areas. It will display one line for each hop along the network route to the target machine. Asterisks (*) indicate a problem finding the next hop. *Note that some firewalls and routers block traceroute. Page fetching may still work even if traceroute doesn’t.*

- **Email**
  Send a small test email to the given email address. This will test the Search Appliance’s email configuration as well as the recipient’s ability to receive emails from the Search Appliance. If the recipient doesn’t get the test email look in Maintenance->Manage Logs->maillog to see if the message was handed off successfully. If it was handed off check the recipient’s spam folder.

### 3.11.5 Appliance system access

This area provides access to the management of the Search Appliance operating system and hardware which is not directly related to indexing and searching.

#### RAID Array Management

*Note:* This area only applies to larger models (such as 3000) that include multiple hot-swap disks in a RAID-5 configuration.

*Note:* The pages in this area may load somewhat slowly as they collect information from the RAID controller.

**Overview**

Little to no maintenance of the RAID array is required. In the event of a disk failure the hot-spare will automatically take over and the array will be automatically rebuilt. The rebuild process takes several hours. After the array is rebuilt the failed disk will have to be manually removed (no shutdown required) and replaced with a same size or larger disk of the same type. After the disk is replaced it needs to be added to the array.

**Details**

The **RAID Status** page displays a summary of the RAID’s state. It’s an abbreviated form of the information on the RAID Management page to provide a quick Good/Bad check.

The **RAID Management** page lists information about the overall RAID array as well as each of the hard disks in the system. Each item starts with a Status and is color-coded to indicate it’s state. Green is good, red is problem, blue is hot-spare disk, light blue is unused disk, yellow is verifying/testing.

The first line of the Storage table contains information about the overall array with the **Use** column set to **Array**. The remaining lines are individual disks, either **Member**, **Spare**, or **None**. Member disks are part
of the RAID array. Spare disks are hot-spares that will take over for a failed member disk.

Each item in the Storage table has associated actions that may be taken.

**Rebuild**  An array that is in a non-optimal state may be forced into a rebuild to become optimal again.

**Verify**  Verifies the integrity of the parity information for the array. This is not generally needed as the array is automatically verified periodically as controlled by the hardware BIOS.

**Fail**  Forces an individual disk into a failed state so that it may be replaced. This is not generally needed as failures will be automatically detected.

**Remove**  This removes a hot-spare disk from the array. It then becomes an unassociated disk with a Use of None. All arrays should have a hot spare.

**Add**  This adds an unassociated disk with a Use of None to the array as a hot-spare.

The first number in the Disk:Addr column (everything up to the :) is the disk number which corresponds to labels on the front panel of the Search Appliance.

**Rebuild/Verify Rate**

The Rebuild/Verify Rate is how aggressively the RAID will rebuild. A higher rate will rebuild a partially failed array more quickly so that it’s in a non-fault-tolerant state for the shortest possible time. The downside of the higher rate is that operations that use the disk such as walks and searches will see slower performance.

**Controller**

This table shows various model and version information about the RAID controller.

**Command**

The Command input box should not be used except at the request of Thunderstone technical support. It is for issuing arbitrary commands to the RAID controller. Putting the wrong thing in this field could irrevocably damage the RAID array and render your machine completely unusable! If the “Ok to run this command” checkbox is not also checked anything in the command input will be ignored.

**Perform**

The Perform button at the bottom will perform all of the actions selected on the form. You must also set "Are you sure you want to perform these actions?" to "Yes" or the actions will not be performed.

**Front panel**

This provides a rough approximation to the physical front panel of the Search Appliance. It shows the drive arrangement to aid in locating the proper disk when performing maintenance.

**Advanced Support Tools**

This area contains tools that Thunderstone Tech Support may ask you to run. You don’t need to do anything in here unless tech support tells you to.
3.11. MAINTENANCE

- **Re-output XSL files** In the past, when a profile was restored from backup or made as a copy, it was possible for a profile’s XSL files on disk to become out of sync with the profile’s settings. This has been fixed, but customers that were running outdated scripts may have profiles in this situation. The **Re-output XSL files** section checks which profiles have settings and files, and will re-write the profile’s XSL data to disk.

- **Re-schedule walks** In the past, when a profile was restored from backup, it was not actually scheduled with the walk schedule (despite its settings saying it was). This has been fixed, but customers that restored profiles with old scripts may still have improperly scheduled profiles. The **Re-schedule walks** section re-applies all profile’s scheduled settings to the walk scheduler.

- **Version 6 Upgrade CSS Fix** When upgrading to Texis version 6 from an earlier version, **Top HTML** and **XSL File** contents should have a CSS `<link>` tag to the default CSS stylesheet. This option provides an interface to automatically update them.

- **Manage Task Monitor** Provides an interface to manage the Task Monitor, which is a background/daemon process that automatically handles various Search Appliance tasks, e.g. updating indexes during settings replication. The queue of pending tasks can be viewed and/or deleted (only if needed by tech support).

- **Manage non-Profile Replication Queue** Provides an interface to view and manage the queue for “non-profile” content when using System Replication Settings. Non-profile content is things that do not apply just one profile, such as **System Wide Settings**.

**Webmin Interface**

This area has its own login and allows for control of various low-level system settings. The login is `admin` using the same password as the `admin` account in the normal interface. If the password gets out of sync somehow it may be reset by setting the admin password from the Accounts area (3.3.11).

- **Remote mounts** Mount/attach remote NFS filesystems and Windows shares so that they may be indexed using direct file:// urls. This method remains available but the newer **Network Filesystems & Shares** (3.11.4) method on the **Maintenance** page is simpler. See also Indexing File Servers (4.18).

- **Network** Configure the IP address, DNS servers, and routing.

- **Firewall** Restrict access by IP.

- **Clock** Synchronize the Search Appliance to your local time.

- **Email delivery** Configure how to send email for walk notifications etc.

- **Shutdown** Shut the system down cleanly and power off.

**Remote mounts using Webmin**
Although the newer Network Filesystems & Shares (3.11.4) is preferred it may rarely happen that you need more options that are available in the webmin interface. In that case use these instructions to mount file servers using webmin.

To mount a file server you need to go to the Maintenance page, then the Webmin Interface, login as admin, and choose Disk and Network Filesystems. You can then Add mount of either NFS (Unix) or Windows Filesystem. When mounting a Windows filesystem the format for the “Mounted As” field should be /SERVER/SHARE (note: single forward slashes) and the “Server Name” and “Share Name” fields should also be filled in (without slashes). The server name in the “Mounted As” and “Server Name” fields should be all lowercase.

For Windows shares you can also specify a user name and password to access the fileserver, and the Search Appliance will walk with those permissions. Use either a username local to the machine owning the share or use a domain login that the server understands. Domain logins have the form DOMAIN\USER.

Note: If mounting a Windows 2003 share fails with a message such as “18048: session setup failed: ERRDOS - ERRnoaccess (Access denied.)”, then on the Windows 2003 server you may need to change the setting Control Panel / Administrative Tools / Local Security Policy / Microsoft network server: Digitally sign communications (always) to be disabled, or perhaps the Domain Member: Digitally encrypt or sign secure channel data (always) setting may need to be disabled.

Generally you will mount the filesystem to save and mount at boot, so the files are always available, and you can set it to read only if desired, which will make sure that the Search Appliance does not write anything to the fileserver.

When walking the Base URL would be file://SERVER/SHARE/. The trailing slash is required for directories. The case of SERVER and SHARE should agree with the “Mounted As” setting.
Example: Windows Server

Windows Networking Filesystem Mount Details
  Mounted As: /corpserv/Repository
  Server Name: corpserv
  Share Name: repository

Advanced Mount Options
  Login Name: AllowedUserName
  Login Password: ******
  Read-only? : Yes

Basic Walk Settings
  Base URL : file://corpserv/Repository/Documents/

Example: NFS Server

Network Filesystem Mount Details
  Mounted As: /corpserv/Repository
  NFS Hostname: corpserv
  NFS Directory: /Repository

Advanced Mount Options
  Read-only? : Yes
  Allow user interrupt?: Yes

Basic Walk Settings
  Base URL : file://corpserv/Repository/Documents/
Chapter 4

Procedures and Examples

4.1 Searching your Index

Search the pages you have indexed by entering the following URL into your Web browser:

http://www.mysite.com/txesis/search/

The above is a virtual path comprised of 2 parts. “.../texis” is the Texit Web Script interpreter and “/search” is the path to the search script relative to your installation’s ScriptRoot (/usr/local/morph3/texis/scripts).

The URL given above will search the live database specified in the default profile called “default”. If that profile is not found it will try to search the default walk database.

You may specify an alternate profile by including its name in the URL.

.../search/?pr=MYPROFILE

Where MYPROFILE is the name of the profile you wish to use. The search will use the live database specified by that profile.

You may also specify a database to search instead of a profile.

.../search/?db=DATABASE

Where DATABASE is the name of the database you wish to use. This would generally be the live database for a given profile which may be found as the first item listed on the administrative interface’s Walk Settings page. Databases used this way must exist under the texis subdirectory of the installation directory. What you specify for DATABASE is only the portion of the path and name under the texis directory. For example, to search the database /usr/local/morph3/texis/myprofile/db2 you would use:

.../search/?db=myprofile/db2
When using a database instead of a profile, the look and feel settings will be those that were live when the walk of that database was performed. The profile will not be consulted for more recent changes. A benefit of not consulting the profile, however, is some increased search speed, which may be useful on a very heavily searched system. A disadvantage of specifying the database is that it will no longer be correct if a new walk is performed.

To get help on constructing queries click on the Advanced button of the search form. On the advanced search form you will find hyperlinks into the search help, which is also included in this manual in section 6.

To place the search form onto your existing web page(s) call up the Live Search from the administrative interface main menu (or the URL you determined from the above). This will bring up the search form. Use your web browser’s view page source option (MSIE: TopMenu->View->Source, Netscape: TopMenu->View->Page Source) to get the source of the page. Cut everything between and including the <FORM> and </FORM> tags. That form may then be pasted into the web page(s) of your choice. You may also rearrange the look of the form as long as the variables are still present. If you have categories there will be a category select list in the form. You may leave this out if you always want to search everything. Or you may make it a hidden variable with a fixed value if you always want to search the same section.

4.2 Similarity Searching

The search script has a feature called “Find Similar” which allows a user to click on a search result record to find more pages within the database similar to that one. This feature may also be accessed from any web page by placing the appropriate URL on it. You may search for pages in your database that are similar to any other web page whether it’s in the database or not. The URL for finding similar pages has the form shown below.


If the profile to be searched is “default” the pr=default& portion may be omitted:

ref=http://somesite/somepage.html

If the profile to be searched is anything other than “default” that must be specified instead of default:

pr=myprofile&ref=http://somesite/somepage.html

If the page to be located is the page the URL is on the ref=URL portion may be omitted:

/texis/search/similar.html or /texis/search/similar.html?pr=myprofile

The similar function will lookup the desired URL in the database or, if it’s not in the database, fetch it from the webserver. It will then search the database looking for indexed pages similar to the specified page.

You could place a URL like this on all of your pages so users could, with one click, find all pages on your site similar in content to the one they were reading.
4.3 Using the Thesaurus Feature

You can create a thesaurus to either replace or add to the default thesaurus. The creation procedure is the same for either usage. Note that a thesaurus is not limited to synonyms. It can contain anything you wish to associate with a particular word: i.e., identities, generalities, or specifics of the word entry, plus associated phrases, acronyms, or spelling variations. The Search Appliance maintains a collection of thesauri that you upload. For each profile you may select which, if any, thesaurus to use.

Here are the steps to use the thesaurus feature.

- Create a thesaurus file. Use the syntax described in the document “User Equivalence File Format” at the following URL: http://www.thunderstone.com/site/texisman/~user_equivalence_file_format.html
  That document refers to the thesaurus as an “equivalence file”.
- Upload your thesaurus to the Search Appliance. At the main menu click Maintenance then under System Settings click Custom Thesaurus. The Custom Thesaurus page opens.
- In the Name field, enter a symbolic name that will be listed as an option in search settings. This name does not have to be related to the filename on disk in any way.
- In the Permutations field, choose a value. This value controls how many variations of your defined terms to create during indexing of your uploaded source file. Here is an example of the effect of the various values.
  Assume a thesaurus entry of: car, ford, chevy, toyota
  Permutation None: Just the terms as you entered them. Query “car” would find “car”, “ford”, “chevy”, and “toyota”. Query “ford” would only find “ford”.
  Permutations Single: The terms you entered and the reverse. Same as above plus a query for any of “ford”, “chevy”, or “toyota” would find “car”.
  Permutations Full: Equate every term with every other in each entry. Same as above plus a query for “ford” would find “chevy” and “toyota”.
- In the New File field, enter (or browse to) the file on your disk to upload. Click Save Changes to upload and index the file. When indexing is completed, you will receive a report about the indexing. If Show results of indexing is checked, you will also get a summary of the indexed words.
- After your thesaurus is installed on the Search Appliance you can go to Search Settings for a profile to activate the thesaurus. There are three related options: Synonyms, Main thesaurus, and Secondary Thesaurus.
- Set Synonyms using the following information. Synonyms indicates how you want to apply a thesaurus (either yours or the default) to queries.
  Disabled: no phrase recognition and no synonyms (equivalences)
  Phrase recognition only: recognize query word groups that are known phrases and search for them as phrases
Phrases & Allow synonyms: phrase recognition plus allowing the tilde ( ) operator to match synonyms on specific query terms

Phrases & Use synonyms by default: phrase recognition and matching synonyms on all query terms (tilde to turn off on specific terms).

- Set the Main Thesaurus and Secondary Thesaurus fields by using the following information. If you want to use only your thesaurus and not the default one, select yours for the Main Thesaurus option and leave verb 'Secondary Thesaurus' set to none. If you want the default in addition to your own, leave Main Thesaurus set to Built-In and set Secondary Thesaurus to yours. The names listed in these options are the symbolic names (Name field) you gave your thesauri when uploading them.

- Click Update to apply these settings. There is no need to check Apply Appearance, and these settings are applied to both Test Search and Live Search.

4.4 Getting Software Updates

You can obtain software updates manually or automatically. For information about getting them automatically, refer to Setup/Edit Update Preferences (3.11.2).

Use the following procedure to manually obtain software updates from Thunderstone. You are able to select which updates you want, if any.

- At main menu, click Maintenance.
- At Maintenance pane, click Check for updates.
- At proxy entry screen, enter proxy information if it is needed to reach the Internet, and then click Continue.
- A list of available updates is presented. Check the boxes for updates that you want to download from Thunderstone, and click Yes. The updates are downloaded to the Search Appliance, but they are not installed yet.
- A window for installation opens. Click Yes to install the updates.
- When the installation is completed, a message indicates that updates are completed.

4.5 Page Exclusion, Robots.txt, and Meta-robots

On the first access to a site the file /robots.txt will be retrieved, if its exists. Settings there will be respected. Any encountered URL that is disallowed by robots.txt will be discarded. Meta robots is also respected for each page retrieved. See http://www.robotstxt.org/wc/exclusion.html for the robots.txt and meta robots standards.

If there are any HTML trees that you don’t want indexed you may want to setup a robots.txt file, meta robots within the HTML pages, or use the various exclusion options to the Search Appliance. For example:
if you had a "text only" version of your web server that duplicated the content of your normal server you would not want to index it. (On the other hand if most of your meaningful text is contained in graphics, Java, or JavaScript you may want to walk the text tree instead of the normal one, since graphics and Java are not searchable.)

Suppose your "text only" pages were all under a directory called /text. The simplest way to prevent traversal of that tree would be to use the exclusion or exclusion prefix.

The exclusion would look something like this:

/text/

The exclusion prefix would look something like this:

http://www.mysite.com/text/

That will prevent retrieval of any pages under the /text tree. This does not prevent other Web robots from retrieving the /text tree. To setup a permanent global exclusion list you need to create a file called robots.txt in your document root directory. The format of that file is as follows:

User-agent: *
Disallow: /text

Where * is the name of the robot to block. * means any robot not specifically named (all robots in this case since no others are named). Or you could specify the name of the robot. For the Search Appliance it would be ThunderstoneSA. You may specify several “Disallow”s for any given robot (see below). The “Disallow”s are simple path prefixes. They may not contain wildcards.

You may also specify different “Disallow” sets for different robots. Simply insert a blank line and add another “User-agent” line followed by its “Disallow” lines.

Here’s a larger example:

User-agent: *
Disallow: /text
Disallow: /junk

User-agent: ThunderstoneSA
Disallow: /text
Disallow: /thunderstonesa

User-agent: Scooter
Disallow: /text
Disallow: /junk
Disallow: /big

The Scooter robot will be blocked from accessing any pages under the /text, /junk, and /big trees. The Search Appliance will be blocked from accessing any pages under /text and /thunderstonesa. All other robots will be blocked from accessing pages under /text and /junk.
Use of robots.txt is not enforced in any way. Robots may or may not use it. The Search Appliance will, by default, always look for it and use it if present. This may be disabled by turning off “Respect robots.txt”. When using robots.txt you may still use “Exclusions” for manual exclusion.

Meta robots provides another method of controlling robots such as the Search Appliance. Any HTML may contain a meta tag in the source of the form.

```html
<meta name="robots" content="WHAT-TO-DO">
```

WHAT-TO-DO may contain any of the following keywords. Multiple keywords may be used by placing a comma(,) between them.

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDEX</td>
<td>Index the text of this page</td>
</tr>
<tr>
<td>NOINDEX</td>
<td>Don’t index the text of this page</td>
</tr>
<tr>
<td>FOLLOW</td>
<td>Follow hyperlinks on this page</td>
</tr>
<tr>
<td>NOFOLLOW</td>
<td>Don’t follow hyperlinks on this page</td>
</tr>
<tr>
<td>ALL</td>
<td>Synonym for INDEX,FOLLOW</td>
</tr>
<tr>
<td>NONE</td>
<td>Synonym for NOINDEX,NOFOLLOW</td>
</tr>
</tbody>
</table>

Like robots.txt this is not enforced in any way. Robots may or may not use it. The Search Appliance always indexes and follows hyperlinks by default so it only looks for NOINDEX and/or NOFOLLOW and/or NONE.

### 4.6 Indexing Other Sites

You may index a site other than your own by specifying its URL just as you would for your own site.

http://www.anothersite.com

Please be kind when indexing other sites. Many are low bandwidth or heavily used already and won’t appreciate being hit hard.

### 4.7 Indexing Individual Pages

To add an individual HTML page to the database, but not go after any of its references, add it to the Single Page list box.
4.8 Reindexing on a Schedule

It is often desirable to reindex a given site on a regular basis because of continuously changing content. You may specify a Rewalk Schedule to handle this for you.

It is also useful to perform a single rewalk at a later time or date to avoid overloading a web server during heavy use periods.

4.9 Checking for Web Server Errors

When you start a walk you will be sent to the walk status page. You may also reach that page at any time by selecting Walk Status from the menu. This page will show you the summary status of the running walk. When the walk completes you will see a summary of the walk as well as a list of any errors encountered. Following the error list is a list of duplicate pages encountered.

You may also view document linkage and info and errors from the List/Edit URLs page (3.3.5) from the menu.

4.10 Removing Pages from the Database

Use the List/Edit URLs menu (3.3.5) to find and delete specific URLs from the database. You may delete individual pages or many pages at once using wildcards.

4.11 Erasing the Entire Database

If you decide to wipe out your existing database and it’s settings to start over go to “Profiles” and click “Delete” next to the profile you wish to delete. This will completely remove the selected walk database and all options related to it.

4.12 Using Multiple Databases

Once you have a live searchable database you may want to build a separate one to contain different kinds of pages or to experiment with, without destroying your live database. Use the Profiles menu to create a new profile and database. You create the new profile with default settings or with a copy of the settings from another profile.

4.13 Integrating the Search Appliance with your Site

There are three main techniques to integrate the Search Appliance with your site. The techniques are categorized as follows:
• Static Host
• Dynamic Host and HTML
• Dynamic Host and XML

The simplest technique, Static Host, uses the built-in capability of the Search Appliance to present a search page directly to a site visitor. Although this technique can be used with a dynamic host, it is commonly used with a static host. On your site, you present either a search field or a simple link. If you present a search field, when a visitor submits a query, the query is sent to the Search Appliance. If you present a link, when a visitor clicks the link, a search page generated by the Search Appliance is presented to the visitor, and the visitor uses this search page to submit a query. In either case, after a query is sent to the Search Appliance, it responds by sending the search results (HTML) to the visitor’s browser. Note that you can customize the HTML of the search page, and this allows you to maintain a consistent appearance for your site and the search page generated by the Search Appliance.

The Dynamic Host and HTML technique can be used in dynamically generated web sites. The host server sends a search query (HTTP request) to the Search Appliance, which responds by sending search results as HTML to the host server. The host server is responsible for sending the search query to the Search Appliance, handling the HTML search results from it, and for all interactions with the site visitor.

The Dynamic Host and XML technique can be used in dynamically generated web sites. The host server sends a search query (HTTP request) to the Search Appliance, which responds with the search results as XML. The host server is responsible for sending the search query to the Search Appliance, handling the XML search results from it, and for all interactions with the site visitor.

4.13.1 Static Host

Use the information in this section to perform the Static Host type of integration.

• Decide whether your existing pages will include a query field or just a link to the Search Appliance search page.

• If your page will use a query field (an HTML form), you can obtain the HTML code that you need from the Search Appliance’s live search page as follows:

  On the Search Appliance, in the Administrative Interface, at the main menu, click Live Search. This opens the search form.

  Use your web browser’s view page source option (MSIE: TopMenu->View->Source, Netscape or Mozilla: TopMenu->View->Page Source) to open a window that contains the source code of the page.

  Cut everything between and including the <form> and </form>. Paste the form into your web page(s).

• If your page will just link to the Search Appliance search page, create the link using the URL of the Test Search. To obtain the URL of the Test Search, at the Administrator Interface, on the main menu, click Test Search. When the Search Appliance search page opens, cut the URL string from your browser, and paste it into your web page(s) at the appropriate link element.
4.13. **INTEGRATING THE SEARCH APPLIANCE WITH YOUR SITE**

- Optionally, if you want to change the appearance of the search page, you can do this by adding HTML to the Top and Bottom HTML settings. At the Administrator Interface main menu, click the Search Settings link, and scroll until Top HTML and Bottom HTML are in view. Add the desired HTML code. For information about using an HTML editor to make these code additions, refer to (section 3.6.29).

- The settings are ready for test runs. Use the Update Test button to apply the “test” settings, and use the Test Search link on the left to try them out.

- After you are satisfied with the appearance and operation of searches using Test Search, you are ready to go live.

- On the Search Settings page, press the Update Live and Test button to make the settings live.

- If you are using a link to the Search Appliance search page, change the link to point to the Live Search, using the same steps you used to set up the link to point to the Test Search.

### 4.13.2 Dynamic Host and HTML

#### Issuing a Query Programmatically

Use the information in this section to issue a query programmatically.

You can use either POST or GET to issue the search query. The only required variables are `pr` (profile), `query` and `dropXSL`. Variables not specified in the query take default values.

Here is an example URL for a search.

```
http://HOSTNAME/texis/search/main.xml?dropXSL=0&pr=default&
 prox=page&rorder=500&rprox=500&rdfreq=500&rwfreq=500&
 rlead=500&sufs=2&order=r&query=query
```

Where `HOSTNAME` is the IP/hostname of your Search Appliance, and `query` is the user’s query.

The following table provides a description of the query variables.

Please see the Additional Fields section (p. 130) for information on specifying additional field
Table 4.2: Search Query Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pr</td>
<td>Specifies the Search Appliance profile.</td>
</tr>
<tr>
<td>prox</td>
<td>Proximity: words should be in the same line, sentence, paragraph, or page.</td>
</tr>
<tr>
<td>rorder</td>
<td>Word order: terms same order as query are better (0-1000; 500 = medium).</td>
</tr>
<tr>
<td>rprox</td>
<td>Indicates how close the words need to be (0-1000; 500 = medium).</td>
</tr>
<tr>
<td>rdfreq</td>
<td>Importance of frequency in the table (0-1000; 500 = medium).</td>
</tr>
<tr>
<td>rwfreq</td>
<td>Importance of frequency in the document (0-1000; 500 = medium).</td>
</tr>
<tr>
<td>rlead</td>
<td>Importance of closeness to document start (0-1000; 500 = medium).</td>
</tr>
<tr>
<td>sufs</td>
<td>Word forms (suffix). 0 (exact), 1 (plurals), or 2 (any), or 3 (custom)</td>
</tr>
<tr>
<td>order</td>
<td>Controls the sort order. Values are r (relevance) or d (date).</td>
</tr>
<tr>
<td>query</td>
<td>Search query entered by site visitor.</td>
</tr>
<tr>
<td>rpp</td>
<td>Results Per Page.</td>
</tr>
<tr>
<td>cq</td>
<td>For categories. cq=1 for 1st, cq=2 for 2nd etc.</td>
</tr>
<tr>
<td>tq</td>
<td>Used for title-only queries.</td>
</tr>
<tr>
<td>uq</td>
<td>Used for URL Prefix queries.</td>
</tr>
<tr>
<td>dq</td>
<td>Used for depth queries.</td>
</tr>
<tr>
<td>mtq</td>
<td>Used for Mime Type queries.</td>
</tr>
<tr>
<td>mdlt</td>
<td>Modified Date less than query</td>
</tr>
<tr>
<td>mdgt</td>
<td>Modified Date greater than query</td>
</tr>
<tr>
<td>dateSource</td>
<td>What date to use, id or Modified</td>
</tr>
<tr>
<td>sq</td>
<td>(Not shown in example) Used for site-specific queries.</td>
</tr>
<tr>
<td>sr</td>
<td>(Not shown in example) Used to limit results per site.</td>
</tr>
</tbody>
</table>

searches in the URL.

dateSource: id vs modified

The dateSource parameter allows you to determine which date associated with the URL gets used for display, sorting, etc.

- Modified (default) - The time the file or page was last modified is used.
- id - the time that the Search Appliance last update its record of the file or page is used.

If a collection of files that were modified a year ago were moved and just now picked up by the Search Appliance crawl last night, then the Modified date would be a year ago, but the id date would be last night.

id is the default dateSource when requesting an RSS feed of a search.
Processing Search Results

The Search Appliance returns search results as HTML with this method, so the results can be passed along to the site visitor without changes, or they can be modified or expanded before they are sent.

4.13.3 Dynamic Host and XML

This section provides information about issuing a query programmatically and receiving the XML search results from the Search Appliance.

Issuing a Query Programmatically

You can use either POST or GET to issue the search query. The only required variables are \( p r \) (profile), \( q u e r y \) and \( d r o pXSL \). Variables not specified in the query take default values.

Here is an example URL for a search.

\[
\text{http://HOSTNAME/texis/search/main.xml?dropXSL=1&pr=default
}&prox=page&rorder=500&rprox=500&rdfreq=500&rwfreq=500
&rlead=500&sufs=2&order=r&query=\text{query}
\]

Where \( HOSTNAME \) is the IP/host of your Search Appliance, and \( \text{query} \) is the user’s query.

Refer to Issuing a Query Programmatically 4.13.2 for definitions of the query variables.

Processing Search Results

Settings in the administrative interface Search Settings control the format of the data the Search Appliance returns in response to a query. Set the Results Style to XSL Style so \( d r o pXSL \) does not use the XSLT, and the Search Appliance will just return the raw XML.

The XML elements are described in the XML Elements in Search Results section, p. 159.
Sample ASP Code

The following ASP code demonstrates sending an http GET command to the Search Appliance and receiving XML search results from it.

```<%
    on error resume next
    dim objSrvHTTP
    dim objXMLSend
    dim objXMLReceive

    set objSrvHTTP = Server.CreateObject("MSXML2.ServerXMLHTTP.4.0")
    set objXMLSend = Server.CreateObject("MSXML2.DOMDocument.4.0")
    set objXMLReceive = Server.CreateObject("MSXML2.DOMDocument.4.0")

    if err.number <> 0 then
        Response.Write err.description
        Response.Write "First error in code."
    end if
    err.clear

    objXMLSend.async = false
    objXMLSend.loadXML("<msg><id>2</id></msg>")
    objSrvHTTP.open "GET","http://HOSTNAME/textis/search/main.xml?dropXSL=1&pr=test&prox=page&rorder=500&rprox=500&rdfreq=500&rwfreq=500&rlead=500&sufs=0&query=test&submit=Submit",false

    if err.number <> 0 then
        Response.Write err.description
        Response.Write "Second error in code."
    end if
    err.clear

    objSrvHTTP.send objXMLSend
    set objXMLReceive = objSrvHTTP.responseXML
    Response.ContentType = "text/xml"
    Response.Write objXMLReceive.xml

    if err.number <> 0 then
        Response.Write err.description
        Response.Write "Third error in code."
    end if
    err.clear
%
```
4.14 Search Result RSS Feeds

Search result RSS feeds can help you monitor a certain search query, and let you know when new results appear for the query.

All search result pages have an RSS link embedded in them. Recent versions of modern browsers, such as Internet Explorer and Firefox, have built-in features that notify you when an RSS feed you’re subscribed to changes.

- IE 7 and 8 - http://www.microsoft.com/windows/IE/ie7/tour/rss/
- Firefox - http://kb.mozillazine.org/Live_Bookmarks_-_Firefox
- Opera - http://www.opera.com/mail/rss/

4.15 OpenSearch Support

The search interface also has an embedded Open Search description. This means that modern browsers can use the Quick Search box (to the right of the address bar) to perform searches on the Search Appliance.

- Bring up the search interface for the profile of your choice
- Hit the “down” arrow next to the Quick Search box
- Choose “Add Search Provider...” to add the Search Appliance to the list of available searches.

Internet Explorer users can find more detailed instructions at http://msdn.microsoft.com/en-us/library/cc848862.aspx

4.16 Using Best Bets

The Search Appliance allows you to create links that will appear either at the top or to the right of the search results when specific keywords are searched for. They can be used for suggested links, or to promote specific URLs so they stand out from the main results. The Best Bet links are arranged into groups, which allow you to enable or disable a group of results easily.

4.16.1 Quick Creation

The easiest way to create Best Bets is to directly add keywords to URLs. This skips the group and display settings, which can be customized later (and are detailed below).

From the “List/Edit URLs” page, enter the URL you want and click on the URL to get the details on that URL. There is a form on the page that allows you to add keywords to that URL. You can define a priority, title, description, and keywords for the URL (as listed in the table below).
The group will be listed as (Create New). This will create a default group and automatically set it to display, instantly using the Best Bet you just created. The created group (default) can then be used to create any number of other keyword-URL associations.

You can go to the “Search Settings” page to customize how the Best Bets are displayed, as detailed below.

### 4.16.2 Fully Customized

The first step in creating Best Bet links is to define a group. This is done from the “Group Settings” tab. You can name the group, and decide which information will be displayed about the group.

After creating a group you can add keywords to specific URLs. From the “List/Edit URLs” page enter the URL you want, and click on the URL to get the details on that URL. Currently you can only use URLs that have been walked and are in the database. The fields on the form are:

- **Priority** (optional) - The priority for this Best Bet. If multiple Best Bets match a single query, their priority fields determine what order they’re shown. If you’re only setting one Best Bet per URL, or aren’t particular about the order, you don’t need to set a priority.

- **Title** - The title that will be displayed for the Best Bet on the search results page.

- **Keywords** - A comma separated list of what keywords will trigger this Best Bet. A Best Bet is displayed when the query is completely contained within one of the keywords for that Best Bet.

- **Group** - Which Best Bet Group this Best Bet will be created in. A Best Bet will only have a chance to match if its group is set to display as either Top Best Bets or Right Best Bets on the Search Settings page.

  If no groups currently exist, (create new) will be displayed, and a group will be created for you if you enter keywords and a title for this Best Bet.

- **Description** (optional) - The description to display for this Best Bet. The Best Bet Group for this Best Bet might be set to not display the description, so it’s optional.

The title and description can contain HTML code. Be careful that it does not disrupt the rest of the page layout. You can create multiple entries for the same URL. Each time you save a new set of blank boxes will be shown.

Once the Best Bets are created you can go to the “Search Settings” page to set up how they are displayed. For the top and right placements you can define which group is shown there, what title if any to display above the links, and the color, size and style of the boxes around the Best Bets.

As with any of the Search Settings these will apply to the “Test Search” first, and then when you apply the settings be copied to the “Live Search”, allowing you to test the settings and make sure they are appropriate before going live.
4.17 Using Access Control

The concepts and actions of access control in the Search Appliance are discussed in detail in the Access Control section, p. 83. The following are some general tips on how to setup and maintain access control rights.

4.17.1 Initial Lockdown

Since the default mode for Access Control when created is to allow all rights to all users for back-compatibility, it is recommended that perms be “locked down” first, and only granted as needed. The admin user, having the irrevocable ability to reset ACLs, should remain a “superuser” with all access, and other accounts turned into lesser-permission users. Lockdown should happen in this order:

1. Allow superuser: The admin user should have an Allow entry for all rights to the top-level Global object.
2. Deny everyone: The group Everyone should have a Deny entry for all rights to the top-level Global object.

With these perms, users other than admin – including new users and profiles created in the future – will not be able to see or modify administrative settings. They can be granted perms as needed later, for example, the Read right could be removed from the Global deny ACE so that they can read but not modify any admin action/setting.

4.17.2 Example: User with Complete Control on One Profile

To configure a user that has complete access to just one specific profile (but no other profiles, nor the rest of administration such as creating accounts etc.), set up the lockdown settings above, then:

1. Create a Profile ACE on the specific profile, for that user, read and write access, and type Allow.
2. Create a Setting ACE for All Settings, for that user, read, write and delete access, type Allow.

The user will now be able to modify any setting on that profile, as well as start/stop walks on it, but will not be able to edit other profiles.

4.17.3 Example: User with Look and Feel Control on All Profiles

To configure a user that has the ability to change the Top and Bottom HTML on any profile, but cannot edit walk settings, nor start nor stop a walk, etc., set up the lockdown settings above, then:

---

1In version 5.3.0 and earlier, the admin user should instead be explicitly granted all rights to each of the second-level objects (All Users, All Groups, All Profiles, All Settings, and Maintenance).
1. Create a Profile ACE on All Profiles, for that user, read and write access, and type Allow.

2. Create a Setting ACE for Top HTML, for that user, read, write and delete access, type Allow.

3. Create a Setting ACE for Bottom HTML, for that user, read, write and delete access, type Allow.

The user will now be able to change the top and bottom HTML for any profile.

4.18 Indexing File Servers

The Thunderstone Search Appliance can index Windows and Unix file servers in addition to web servers. To do so you will first need to mount the file server to the Search Appliance, and then configure the walk.

To mount the file server you need to go to the Maintenance page and select Network Filesystems & Shares 3.11.4.

After you have mounted your server to the Search Appliance the interface will give you the base url to use in your profile. You may use that url or anything underneath it.

4.19 Replication

4.19.1 Replication Overview

In replication, a server profile sends walk data to another server profile. The two profiles can be on different machines or they can be on the same one. If the profiles are on different machines, the sending and receiving profiles can have the same or different names. If the profiles are on the same machine, use different profile names.

Here is an example that illustrates the replication process. In this example, the Sender profile has been set up as the sender profile and Receiver is the receiver profile. After Sender performs a walk, it sends the walk data to Receiver. The Receiver profile accepts the data as-is, without regard to its own profile settings. Only the profile that performed the walk may send the walk data, so in this example Receiver cannot replicate (the data it received from Sender) to another profile.

To avoid undesired overwriting of replication walk data, you should not allow the receiver profile to perform walks.

Before the receiver will accept replication data, the sender(s) need to be granted permission to send the data. This permission is managed in a cluster member list.

A good use of replication is to set up multiple machines to replicate to a single receiving profile. For example, machines A, B, and C each have a different profile, and they each replicate their walk data to a profile on machine D, which is the receiver. Another use of replication is to send walk data from multiple profiles on a machine to a single receiver profile that is on the same machine. This provides a means of combining walk data into a single profile. Another use of replication is to replicate data from one sender to multiple receivers. This way multiple machines hold the same walk data.
4.19.2 Procedure

The procedure in this section is an example of setting up replication on a single machine. It can be adapted to multiple machine configurations by changing the Replication Settings.

Set up the Sender Profile

- Choose an existing, walkable profile to be the sender. Or go to the Profiles menu item and create one, filling in all fields for a normal walk. We’ll assume this profile is called Sender.
- Go to the All Walk Settings menu item for the Sender profile.
- Scroll down to Replication Settings.
- Enter the information for the receiver. In this example, Host IP or Name is localhost because we’ll be sending data to the same machine, and Profile Name is Receiver. The page now includes the location of the receiver profile.
- Click Update and Go button.
- After a moment, the Walk Status page opens. Notice that there are \( N \) items in the replication queue. The number \( N \) is similar to the number of pages that were walked. The items remain in the queue, because they cannot be sent until the receiver profile is created (below). Normally, when a receiver profile is present, the contents of the queue are automatically sent to the receiver.

Create the Receiver Profile

- Create a new profile called Receiver via the Profiles menu item. (This matches the receiving profile name we entered on the Sender profile.)
- At main menu click Maintenance, then under Search Appliance Settings heading, click System Wide Settings.
- At the Cluster Members field, enter the IP address for each server that will send walk data to this machine. Use a separate line for each entry. In this example, there is one sending IP address, and it is 127.0.0.1 (use IP numbers, not the word localhost). To enable an entire subnet to send data, use an IP prefix and wildcard, e.g. 10.10.1.
- Click Update button.
- At main menu, click Profiles.
- When Profiles page opens, click Sender. A Walk Settings page opens for the Sender profile.
- Click Walk Status button. The Walk Status page for the Sender profile opens.
- There are still \( N \) items in the replication queue.
- Click the replication queue link.
The items in the replication queue are sent to the Receiver profile. On the Walk Status page, there are now 0 items in the replication queue, which indicates the items were sent.

On main menu, click Profiles, click Receiver, click Walk Status and observe that there is a list of pages recently walked. These pages were not walked by Receiver, instead they were obtained from Sender, which performed the walk.

4.19.3 DataLoad API

The replication system can also be used to load data directly onto the Search Appliance from an outside source, instead of “pulling” it from a URL or its links. This can be used for data that is not permanently stored at its URL (e.g. generated data), and therefore cannot be fetched for indexing; it can instead be pushed to the Search Appliance for indexing. This feature requires version 5.4.19 or later of the texisScripts package (see Maintenance / Check for Updates).

Before loading data onto the Search Appliance, it must be configured to accept data from the IP address(es) that will be sending to it. This procedure is the same as for replication; see the Cluster Members setting, p. 123.

Submission Format

Data is submitted to the Search Appliance with an HTTP POST request sent to a similar URL as the admin interface (e.g. http://.../dowalk), but with /recvdata.xml appended. E.g.:

http://www.mysite.com/texis/dowalk/recvdata.xml

The following POST variables must be set in the request. Be sure to URL-encode the values:

- profile
  Set to the name of the receiving profile.

- data
  Set to an XML document containing the data, and what to do with it (insert/delete/etc.). See below for details.

Specifying all fields manually
Below is an example data document where all fields are specified. Be sure to HTML-encode values.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<ThunderstoneReplication
    xmlns:dt="urn:schemas-microsoft-com:datatypes"
>
  <Item>
    <Type>I</Type>
    <Size>150369</Size>
    <Visited>2005-10-25 15:25:18</Visited>
    <Dlsecs>0</Dlsecs>
    <Depth>0</Depth>
    <Url>http://www.mysite.com/dir/page.html</Url>
    <Title>Sprocket Specifications</Title>
    <Body>...</Body>
    <Keywords>sprockets, gears, hubs</Keywords>
    <Description>Sprocket details</Description>
    <Meta/>
    <Category>Mechanical</Category>
    <Modified>2005-10-25 11:21:07</Modified>
    <NextCheck>2005-10-25 16:25:18</NextCheck>
    <Views>0</Views>
    <Clicks>0</Clicks>
    <CTR>0.000000</CTR>
    <Pop>0</Pop>
    <MimeType>text/html</MimeType>
    <Charset>UTF-8</Charset>
    <Refs dt:dt="bin.base64">...</Refs>
    <Errors dt:dt="bin.base64">...</Errors>
    <RawData dt:dt="bin.base64"></RawData>
  </Item>
</ThunderstoneReplication>
```

Any element whose text data might not be XML-safe (e.g. binary chars in the `<Body>`) should be base64-encoded, and the attribute `dt:dt="bin.base64"` set in the tag. E.g. the `<Refs>` and `<Errors>` elements’ text data are always base64-encoded. Note that the XML namespace prefix `dt` should also then be set to `urn:schemas-microsoft-com:datatypes` in the root `<ThunderstoneReplication>` element.

The elements are:

- `<Type>` The action to take with this data. Text value may be one of:
  - `I` Insert the data (overwrite previous data for URL if any)
  - `D` Delete the URL
  - `DP` Delete the URL as a pattern (e.g. `http://www.mysite.com/dir/*`)
- UI Update search indexes (call after a batch of inserts/deletes)

- `<Size>` The integer size of the original document.

- `<Visited>` When the document was fetched, in `YYYY-MM-DD HH:MM:SS` format.

- `<Dlsecs>` Number of seconds taken to download the document.

- `<Depth>` Depth of URL from a Base URL, e.g. 0 is a Base URL, 1 is one click away, etc.

- `<Url>` The URL of the document.

- `<Title>` The title of the document.

- `<Body>` The formatted body of the document.

- `<Keywords>` Any keywords for the document.

- `<Description>` The description of the document.

- `<Meta>` Any metadata for the document.

- `<Category>` The category the document is in, if any. Must be a category name from the profile’s Categories.

- `<Modified>` The `Last-Modified` date of the document, in `YYYY-MM-DD HH:MM:SS` format.

- `<NextCheck>` When the document should be refreshed, in `YYYY-MM-DD HH:MM:SS` format.

- `<Views>` Number of views of the document: how many times it’s been shown in search results.

- `<Clicks>` Number of clicks of the document: how many times it’s been clicked on in search results.

- `<CTR>` Click-through-ratio: floating-point number ratio of clicks to views.

- `<Pop>` Document popularity: number of references (links) to it.

- `<MimeType>` The MIME type of the content served at the URL, or provided in RawData.

- `<Charset>` Character set of `<Body>` data. Should correspond with Storage Charset profile setting (p. 38). If a charset other than the Storage Charset is used, it should be a standard IANA charset that the Search Appliance can convert to the Storage Charset.

- `<Refs>` Optional element with references (child links) of the document.

- `<Errors>` Optional element with errors of the document.

**Uploading a binary file**
If you have a binary file, such as a PDF or an Office document, you can send it with the dataload API and let the Search Appliance extract the text from it.

```xml
<?xml version="1.0" encoding="UTF-8" ?>
<ThunderstoneReplication
   xmlns:dt="urn:schemas-microsoft-com:datatypes">
   <Item>
      <Type>I</Type>
      <Url>http://www.example.com/dataload.pdf</Url>
      <RawData dt:dt="bin.base64">0M8R4KGxGu....</RawData>
   </Item>
</ThunderstoneReplication>
```

The elements are:

- `<Type>` The action to take with this data. Text value may be one of:
  - I Insert the data (overwrite previous data for URL if any)
- `<Url>` The URL of the document.
- `<RawData>` element with the base64 encoding of raw document. It must include the `dt:dt="bin.base64"` attribute.

**Combining the two: binary files with custom fields**

It is possible to specify both a `<RawData>` document, *and* fields such as `<Title>`, `<Description>`, etc. The binary document will be processed, and any other fields provided will override the values that came from the document.

This can be useful in situations where you have a Content Management System (CMS) that contains metadata about a document that doesn’t actually *occur* anywhere in the document. You can do a custom dataload that pushes in the document, and the custom Title/Description/etc.

**Additional Fields**

Each profile-specific Additional Field is optionally sent in a single element named after the field, with the XML namespace prefix `u`. The value of the field is the content of the XML element. Note that the `u` XML namespace prefix should be declared in the root `<ThunderstoneReplication>` node, as shown earlier.

For example, an Integer field `Quantity` and a Text field `State` may be given as:

```xml
<u:Quantity>57</u:Quantity>
<u:State>NY</u:State>
```

**Other Details**
The optional `<Refs>` element lists the links (references) from the given document, for parent-child linking. Its text value is a base64-encoded XML document with the following format when decoded:

```xml
<results xmlns:dt="urn:schemas-microsoft-com:datatypes">
  <result>
    <Url>http://www.mysite.com/dir/page.html</Url>
    <Ref>http://www.mysite.com/dir/otherpage.html</Ref>
  </result>
  ...
</results>
```

Each `<Url>` should be the same as the `<Url>` in the above `<Item>` block. The `<Ref>` is a single link from the page. Only one `<Ref>` may be listed per `<result>`; additional links should be sent with additional `<result>` elements.

The optional `<Errors>` element contains any errors to be logged for the document. Note that this may be empty or not present if no errors are to be logged. Its text value is a base64-encoded XML document with the following format when decoded:

```xml
<results xmlns:dt="urn:schemas-microsoft-com:datatypes">
  <result>
    <Url>http://www.mysite.com/dir/page.html</Url>
    <Reason>Document not found: 404 (Not Found)</Reason>
  </result>
  ...
</results>
```

As with the `<Refs>` element, the `<Url>` must correspond with the original `<Item>` `<Url>`, and multiple errors must be listed in separate `<result>` elements.
Reply Format

The response to a DataLoad request is an XML document:

```xml
<ThunderstoneReplicationResult>
  <ItemResult>
    <rid>000000000</rid>
    <Type>D</Type>
    <DP>1</DP>
    <Status>OK</Status>
    <Info>Not found</Info>
  </ItemResult>
  <Rows>1</Rows>
  <Version>Version 5.01.1234567890 20051010 (...)
    2005-10-10 12:34:56</Version>
</ThunderstoneReplicationResult>
```

The elements are:

- `<rid>` The replication id. Ignored.
- `<Type>` The action type specified in the request.
- `<DP>` The number of URLs deleted by a `<Type>DP</Type>` action. Element is not present for other `<Type>`.
- `<Status>` Result code:
  - OK Success
  - FAIL_UNKNOWNTYPE The `<Type>` was not recognized
  - NODATA No parsable data in request
  - Not Allowed Sender is not a Cluster Member
  - No Profile No profile set in request POST
  - FAIL Failed, unknown reason
- `<Info>` Optional additional message; e.g. Not found if a non-existent URL is deleted
- `<Rows>` How many request `<Item>`s were processed.
- `<Version>` Version and release date of the software.

Once data has been successfully loaded onto the Search Appliance, if the profile has any receiver profiles defined under Replication Settings, the data will also be queued for replication to those receivers.
Dataload SOAP API

There is a SOAP API available for dataload, allowing you to use a SOAP library to communicate with the Search Appliance. For an overview of SOAP, Please see the SOAP API section (p. 138).

The WSDLs for the dataload API can be found on the Profile Tools page. Providing these WSDLs to whatever tool your language uses, such as Visual Studio's wsdl.exe program, should generate the necessary wrapper class.

The parameters are defined within the WSDL itself, and are generally the same as mentioned above in the Submission Format and Reply Format sections, with a few exceptions:

- The entire transactions are wrapped by SOAP envelopes and the top-level elements are called dataload and dataloadResponse instead of ThunderstoneReplicationResult, respectively.
- The dataload element contains a profile element in addition to all the Items.

C# Example Project

A C# example project is available that demonstrates using both the search and dataload SOAP interfaces. In the Maintenance section of the administration interface, choose Extra Downloads, and then Thunderstone Soap Example. Instructions are listed on that page and within the zip itself for how to use the project.

4.20 Additional Fields

4.20.1 Overview

The additional fields feature in the Search Appliance allows you to define structured data that can be searched on, sorted by, and included in the results when using an XSL stylesheet. Typical uses might include having prices, dates or ratings associated with the documents.

4.20.2 Populating

To populate the additional fields they should first be defined in the Additional Fields section of the walk settings. You can specify a name, which is used as the name of the XML element when displaying the results, as well as when using the DataLoad API.

Once the field has been defined it can be populated either via the DataLoad API or through the Data From Field settings section. The fields are positionally numbered, and you can load Extra Field 1, 2 and/or 3 from the page that is read. If you are loading from a <meta> field you will typically want a REX Search of .+ and the From Meta Field you are loading from.
4.20.3 Sorting

To sort the results you can use the `order` form variable. To specify the first field you can set the value to `af1`, for the second `af2` and for the third `af3`. If you want to reverse the sort order you add a `d` to the value, i.e. `af1d`, `af2d`, `af3d`.

4.20.4 Searching

To add a search restriction to the query you can specify form variables with a name constructed as `af#OP`, where `#` is the number of the additional field, 1, 2, or 3, and `OP` is one of the following:

- `eq` - the field is equal to the form variable (e.g. `af1eq`)
- `gt` - the field is greater than the form variable (e.g. `af2gt`)
- `gte` - the field is greater or equal to than the form variable
- `lt` - the field is less than the form variable
- `lte` - the field is less or equal to than the form variable

4.21 DBWalker

4.21.1 Overview

The Texit DBWalker module provides a walkable HTML interface to a remote database. If there is a database server somewhere which has a JDBC driver, DBWalker can serve up that database via HTML, which can then be walked by the Search Appliance or viewed by users. DBWalker can be configured to print all records on a single page, or to provide an “index” page which creates links to individual pages, each of which shows a single record of the table.

DBWalker is different from the normal idea of an “import” in multiple ways:

- DBWalker does not do any actual “importing” at all - it simply enables a way to view parts of a database through a website. It’s still up to the Search Appliance to walk the given website and index its content.
- The idea of ‘import’ implies a one-time action. Because DBWalker provides a HTML interface, it can be used to keep up to date with changes to the remote database. If a single record in the remote database changes, then DBWalker’s HTML interface will be different, and a refresh crawl by the Search Appliance will see this and change its internal index accordingly.

JDBC connections are cached across HTTP requests. The first time a request for a configuration is received, it establishes a JDBC connection and keeps it for 5 minutes. If another request for the same configuration is received, it will re-use the same connection. This greatly enhances the Search Appliance’s crawling speed, and keeps from bogging down the remote database with unnecessary connect/disconnect activity. JDBC connections are closed after 5 minutes of inactivity.
4.21.2 Configuration Overview

DBWalker uses multiple individual configurations for the different databases and tables it needs to talk to. Each configuration describes a single group of settings for a single table in a single database. It is possible to have multiple configurations use the same table and databases – for example, you can have one configuration list the entire contents of a table, while another configuration limits the data to a certain range.

Each configuration specifies which database to talk to with a type (“PostgreSQL”, “Oracle”, etc., which determines what JDBC driver to use), a JDBC connection string (which specifies things like host, port, and database), a username, and a password. The configuration must also specify which table is to be read, and can optionally specify which columns to read (defaults to all), any filter for the data (by way of a WHERE clause), and a key field.

If no key field is specified, then DBWalker won’t know how to uniquely identify rows, so it will print all the data on a single HTML page. If a key field is specified, then DBWalker will create an index page, which lists only the key field column. Each row’s key field is listed as a link back to DBWalker, which will give a page displaying all of the selected fields of only that record. This allows more fine-grained indexing and searching in large tables.

4.21.3 DBWalker Output Overview

The DBWalker’s internal libraries produce XML output. This is transformed into HTML via a XSL stylesheet, which is changeable on a per-configuration basis. When a request is received that ends in .xml, DBWalker will return an XML document with a reference to an XSL stylesheet on the DBWalker server (which modern browsers will automatically fetch and apply).

However, if a request is received with the extension .html, DBWalker will apply the stylesheet server-side before the client ever sees it, and hand the resulting HTML to the client. This is useful for clients that do not apply XSL transformations to XML documents (like the Search Appliance).

4.21.4 DBWalker Authentication Overview

There are two ways to do authentication with the remote database. Authentication information can be stored in the config file, or it can be provided dynamically.

If a username and password are provided in the configuration, then that user/pass will be used for every request for that config. This has the advantage that users never have to input a username/password, but also has the security disadvantage that anyone who opens the website can see the data. Depending on the contents of the database, this may or may not be significant.

The other option is to not include a username or password in the configuration. When DBWalker is invoked by in this situation, it will prompt for a username/password (via Basic authentication). If the remote database accepts the credentials, the page is displayed. For the Search Appliance to walk these pages, it will have to know a valid username/password for the pages. This is supplied in the Login Info section of All Walk Settings ((47).

This integrates well with Results Authorization. If the Search Appliance’s search is set to use Authorized
Search Results with “Prompt via Form”, the credentials will automatically be verified with DBWalker.

To summarize a few key points:

- If you include a username and password in the DBWalker config, anyone will be able to see the results, including searches with Results Authorization in use: any user’s login will work since the correct user/pass is “built in” to the DBWalker config.
- If no user/pass is included in the config, then users will have to supply their own username/password, and the config can be used properly with Results Authorization.
- If no user/pass is included in the config, be sure to put a valid username/password in the Login Info (pg. 47) section of any profile that uses it so the Search Appliance is able to index the content. If the Search Appliance can’t see the results, then no searches will find it!

### 4.21.5 Obtaining DBWalker

DBWalker is obtained through the Check for Updates section of the Search Appliance maintenance. The j2re update must be installed prior to the DBWalker update. Please see the Getting Software Updates section (pg. 110) for details on installing software updates.

### 4.21.6 Managing DBWalker

- At main menu, click Maintenance.
- At Maintenance pane, click DBWalker Settings / Status.

The main DBWalker Administration interface is divided into 3 sections:

- **DBWalker Status**
  This shows whether the DBWalker is currently enabled, and if so what the process ID is. A button is provided to enable or disable the DBWalker, whichever is applicable.
  A link is also provided to the DBWalker Global Options page.

- **DBWalker Configurations**
  This section lists all the configurations available for DBWalker. It shows the configuration name, what type of database it uses, its table, and its JDBC connection string. If the DBWalker Server is currently running, the name of each configuration will be a link to that configuration’s DBWalker page.
  Here you have the option to edit or delete any configuration, and to create new ones with the “Create New Configuration...” button at the bottom. Please see the Managing DBWalker Configurations section below for more information on managing configurations.

- **DBWalker Stylesheets**
  This section allows you to manage the XSL stylesheets that DBWalker uses. You can add, delete, or modify, or view stylesheets here. Please see the Managing DBWalker Stylesheets section (pg. 137) below for more information on stylesheets and how to manage them.
4.21.7 DBWalker Global Options

The DBWalker Global Options page lists settings that affect all configurations, usually involving the DBWalker environment.

These are considered “advanced” settings and should only need to be changed if advised to by Thunderstone Support.

- **LogLevel**
  
  This affects how much information is written to `DBWalker.log`. Each level includes all levels above it.

  - **SEVERE** - Errors that cause the DBWalker to fail, giving it no chance to continue. These include errors reading the server config file, server socket errors, errors setting up the JDBC classloader, etc.
  - **WARNING** - errors that cause an individual request to fail, but allow the server to continue on servicing other requests. These include individual connection socket errors, individual configuration errors errors, unexpected SQL errors, etc.
  - **INFO** - This is the default logging level. Logs errors that are probably caused by malformed clients, or other things that we think an admin should know about. Includes clients giving malformed HTTP headers, requesting nonexistent configs, server startup/shutdown notification, etc.
  - **CONFIG** - reports all information being read from configuration files.
  - **FINE** - More fine-tuned book-keeping without going into details about individual classes/methods. Includes worker/socket assignment, worker pool manipulation, cache manipulation, enter/exit of JDBC methods.
  - **FINER** - reports run/stop/resume of individual threads, more details of worker processing of socket.
  - **FINEST** - Kitchen sink and then some. This will cause the log to fill very quickly with superfluous information during normal operation, and is advised not to be used unless requested by Thunderstone Support.

  The default value of INFO is fine for normal operation.

- **Max JVM Memory**

  This allows you to increase the maximum amount of memory, in megabytes, that the JVM will allow itself to allocate. If you are working with very large tables and getting `OutOfMemoryException` errors, then you may need to increase this. The default value is 64Mb.

  Note that this value is not the amount of memory that will be immediately allocated by the JVM - it will only allocate as much as it needs. This simply provides an upper limit on how much memory will be used.

- **Accept Debug Connections**

  When working with Thunderstone Software, this can assist in the troubleshooting of DBWalker problems. There’s no reason to set this unless Thunderstone Support tells you to.
4.21.8 Managing DBWalker Configurations

Choosing to either edit a configuration or create a new one takes you to a listing page where you can change the facets of a configuration.

- **General Information**

  The General Information section contains things that don’t pertain directly to the remote database itself.

  - **Configuration Name**
    
    If you’re creating a new configuration, you will be asked to enter a name. It is used when specifying which group of settings you want to use when DBWalker is invoked, but has no bearing beyond that. Names may contain letters, numbers, dashes, and underscores (no spaces).

  - **Stylesheet**
    
    Specifies which XSL stylesheet to use. You can only use stylesheets that you’ve already uploaded. Please see the Managing DBWalker Stylesheets section (pg. 137) for more information.

  - **Max Rows per Page**
    
    Sets a maximum number of rows to use on a single index page. If there are more rows than is allowed on a single page, next and back links are used as necessary to see the rest of the links. This is because if a table contains 10 million rows, just generating the index page can take huge amounts of time. DBWalker can be told to only deal with 100 rows at a time, keeping it from getting bogged down.

  - **Appliance Link**
    
    If you are using an internal interface to access the Search Appliance’s administrator interface, this can allow you to force the DBWalker to be walked through an interface that will be visible to external users. Usually the default for this will be fine.

    If administrators are accessing the Search Appliance through an internal-only interface, let’s say internalonly.mysite.com, then the DBWalker will get walked as http://internalonly.mysite.com/texis. This will work fine for the walk itself, but when external users use search, they will see results referencing internalonly.mysite.com, which they won’t be able to access.

    By setting Appliance Link to something like www.mysite.com/texis (or whatever external users will be able to see), then the DBWalker will get walked with the proper links.

- **Database Information**

  The database information section collects information about how to connect to your remote database.

  - **Type**
    
    This determines which JDBC driver will be loaded. DBWalker comes with support for Oracle, Microsoft SQL Server, Sybase, PostgreSQL, MySQL, and Texis. The Oracle (dedicated) type is used to connect to an Oracle database through dedicated mode instead of the default shared mode. There is a slight performance disadvantage to this, and should only be used when the ordinary Oracle type does not work.
Alternatively, you can select [jdbcConnect] as the type, which lets you manually enter the JDBC Connection String. The Host, Port, and DB/Service values are all contained in the JDBC connection string, so the Connect String field replaces all 3 of them.

- **Host/Connect String** The contents of this field depend on what Type you have selected.

<table>
<thead>
<tr>
<th>Database Type</th>
<th>field contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle, Sybase, PostgreSQL, MySQL, or MS SQL Server</td>
<td>the hostname of the machine you’re connecting to, or its IP address.</td>
</tr>
<tr>
<td>Texis</td>
<td>the hostname and full path to the jdbc script on the remote server, i.e. host.mysite.com/texis/jdbc.</td>
</tr>
<tr>
<td>[jdbcConnect]</td>
<td>the full JDBC connection string.</td>
</tr>
</tbody>
</table>

If the type is [jdbcConnect], then this field is Connect String, which lets you specify the full JDBC connection string. This is useful if you already know the JDBC connection string for your remote DB and don’t want to have to break it down into hostname, port, etc. The exact formatting of this string differs for each remote database type.

- **Port** The port number that the remote database is listening to.

<table>
<thead>
<tr>
<th>Database Type</th>
<th>field contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle, Sybase, PostgreSQL, MySQL, or MS SQL Server</td>
<td>the port to use, or leave blank for the default.</td>
</tr>
<tr>
<td>Texis</td>
<td>unused, already specified as part of the Host field.</td>
</tr>
<tr>
<td>[jdbcConnect]</td>
<td>unused, already specified as part of the Connect String field.</td>
</tr>
</tbody>
</table>

- **DB/Service** The contents of this field is dependent on your database type.

<table>
<thead>
<tr>
<th>Database Type</th>
<th>field contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sybase, MS SQL Server, PostgreSQL, or MySQL</td>
<td>the name of the database you want to connect to.</td>
</tr>
<tr>
<td>Oracle</td>
<td>the name of the service to connect to.</td>
</tr>
<tr>
<td>Texis</td>
<td>the full path to the remote database, i.e. C:\morph3\texis\testdb\ or /var/db/testdb.</td>
</tr>
<tr>
<td>[jdbcConnect]</td>
<td>unused, already specified as part of the Connect String field.</td>
</tr>
</tbody>
</table>

- **Username**
The username to give to the remote database. If this is left blank, username/password will be asked from the user when a request is made. Please see the “DBWalker Authentication Overview” section (pg. 132) for more information.

If connecting to a Microsoft SQL Server database, it’s possible to enter DOMAIN/user as the username to use domain authentication, where DOMAIN is the domain that the server belongs to.

- **Password**
The password to give to the remote database. If this is left blank, username/password will be asked from the user when a request is made. Please see the “DBWalker Authentication Overview” section (pg. 132) for more information.

- **Table Information**
The table information section collects information about the table that you want to access.

- **Table**
  the name of the SQL table you want to retrieve data from.
- **Fields**
  An optional list of fields to retrieve from the table. By default, all fields are retrieved. This is specified as a comma-separated list, as you would use in the beginning of a SQL query.

- **Where clause**
  Allows you to limit the data returned by DBWalker. It is not limited to using the fields specified in the **fields** section. The where clause should not contain the SQL keyword **WHERE**, just the conditional clause. For example, if your table has an id and a name, you could set **Fields** to **name** and **Where clause** to **id>100** to only get names of records where the id is greater than 100.

- **Key Field**
  Specifies the “key” field of the database. This field should be able to uniquely identify each record in the table, allowing DBWalker to create a list of links to each record from a single index page. If no key field is specified, the entire contents of the table will be displayed.

### 4.21.9 Managing DBWalker Stylesheets

XSL Stylesheets allow you to customize the way the DBWalker results are presented via HTML. They are applied either server-side or client-side, as detailed in the **DBWalker Output Overview** section (pg. 132) above.

Here you can edit or delete stylesheets, or upload new ones. If the DBWalker server is running, you can view any stylesheet by clicking that stylesheet’s name.

- **Uploading XSL Stylesheets**
  Beneath the list of current stylesheets is the **Upload Stylesheet** section. Here you can browse to a .xsl file and upload it to the Search Appliance.

  If the file already exists, the **Overwrite existing** box must be checked when you upload, to make sure you acknowledge the old file will be overwritten.

- **Editing XSL Stylesheets**
  There are two methods for edit XSL stylesheets. The simplest way is to click on the “Edit” button next to a stylesheet. This provides a page with a large text area that contains the contents of the stylesheet. Make your changes and click “Save” to save the changes.

  If you’re doing heavy development to a stylesheet, you’ll probably find working in a text area very limiting. Alternatively you can download the stylesheet (by clicking on its name on the main **DBWalker page**), make the changes you want locally with your preferred XSL editor, and re-upload the file. If further tweaks are necessary, simply change the file and re-upload it as much as necessary.

### 4.21.10 Adding Configurations to Profiles

To get the contents of a DBWalker config searchable, you add it to one or more profiles, where it will be crawled with the rest of the profile.
On the All Walk Settings page (pg. 26), there is a multi-select box listing all of DBWalker’s configurations. Simply select all the configurations you would like to be included in that profile, and they will be walked.

4.22 SOAP API

4.22.1 SOAP Overview

The Simple Object Access Protocol (SOAP) is a W3C (World Wide Web Consortium) recommendation that essentially allows for Remote Procedure Call (RPC) functionality over HTTP, via XML. (This is a simplification of the 120-page SOAP spec, but it suits our purposes). SOAP web services provides a systematic, defined way of communicating function requests and responses over a network transport.

SOAP interfaces are described by another W3C recommendation, WSDL documents - Web Services Definition Language. WSDL documents are the prototypes for SOAP functions. They define what parameters are expected to the functions, what formats are/aren’t allowed, what will be returned, etc. Given the WSDL of a SOAP web service, it’s possible to generate the client code that interacts with the services (as is demonstrated in the C# example project later).

Specifically for the Search Appliance, the SOAP interface provides, when using a language that has a SOAP API, a way to invoke a search and on the Search Appliance and insert data as if it were a local function call.

4.22.2 SOAP API vs. XML Output

The SOAP interface provides functionality very similar to the “XML output” search interface. So why use one as opposed to the other?

Use SOAP if the language you are writing has a SOAP interface available for you. Many languages and environments (including Visual Studio) provide SOAP tools, where you provide the WSDL to the webservice, and it will generate “wrapper” classes for you, allowing you to interact with the Search Appliance as if it were simply a local function.

If whatever development environment you’re using doesn’t have a real SOAP interface, then use the XML API instead of the SOAP API. All the added information/rules of SOAP that make it easy for programs to exchange data will instead make it more cumbersome to use manually.

4.22.3 Getting the WSDL

The WSDLs can be found on the Profile Tools page for the profile. It links to the Dataload WSDL selector and a search WSDL selector, which lets you choose either a WSDL for this profile, or for all profiles (as explained below).
4.22.4 Global vs. per-profile WSDLs

When viewing search WSDLs, you have the option of requesting a WSDL specific to a single profile, or a global All Profiles WSDL, which can be used for any profile.

If you don’t make use of Additional Fields, then there will be no difference between per-profile and global WSDLs.

Both per-profile and global WSDLs refer to the same search interface. The same SOAP response is generated for both WSDLs. The only difference is in how specific the WSDLs are - per-profile WSDLs specify which Additional Fields occur in the results, but the global WSDL must use `<xsd:any>` as a catch-all, as the Additional Fields may change from one profile to another.

Which you use is a trade-off that you must decide on.

- **per-profile WSDLs**
  - **Advantage** Additional Fields for the profile are “hard-coded” in the WSDL itself, so a SOAP client consuming the WSDL can make better use of the Additional Fields.
    
    For example, if your profile has Additional Fields called `price` and `location`, then a per-profile WSDL will specify that each result contains `<price>` and `<location>` elements.
    
    WSDL tools can do things like declare `response.price` and `response.location` variables.
  
  - **Disadvantage** Because the per-profile WSDL is specific to that profile’s Additional Fields, a different WSDL must be used for every profile you want to interact with. If you’re interacting with many different profiles (or it often changes), a global WSDL may be better suited.

- **Global WSDLs**
  
  - **Advantage** The All Profiles wsdl can be used for any profile. This is better if your application needs to query multiple profiles, or if you don’t work with Additional Fields.
  
  - **Disadvantage** Additional Fields are represented in the All Profiles WSDL with `<xsd:any>`, which allows it to not declare which Additional Fields will occur in the XML (as it may change from one profile to another).
    
    This means that programs consuming the WSDL cannot know which parametric fields will be returned, and will instead do things like offer an array of Additional Field XML elements that you must manually loop over to find the ones you want.

4.22.5 Configuring the SOAP Interface

The WSDL for the Search Appliance is accessible in the following URL path from the Search Appliance:

/texis/Thunders to ne SearchService/describe.wsdl

This link is also available from the SOAP Tools section, within Profile Tools in the admin interface.
Dataload SOAP API

The Dataload SOAP API takes the same parameters as the normal dataload API, please see the Submission Format (p. 124) and Reply Format (p. 129) sections, with a few exceptions:

- The entire transactions are wrapped by SOAP envelopes and the top-level elements are called `dataload` and `dataloadResponse` instead of `ThunderstoneReplicationResult`, respectively.
- The `dataload` element contains a `profile` element in addition to all the `Items`.

### 4.22.6 C# example project

A C# example project is available that demonstrates using both the search and dataload SOAP interfaces. In the Maintenance section of the administration interface, choose Extra Downloads, and then Thunderstone Soap Example. Instructions are listed on that page and within the zip itself for how to use the project.

### 4.22.7 SOAP Links for Languages

This section contains links for recommendations of SOAP implementations in other languages. Thunderstone makes no guarantees to the completeness or quality of these projects, we simply provide links for convenience.

- **ASP.NET** - the same C# API code can be compiled into a .NET assembly and used from an ASP.NET page.
  
- **Perl** - SOAP::Lite for Perl is a collection of Perl modules which provides a simple and lightweight SOAP interface.
  
- **Python** The Web Services for Python Project provides libraries implementing the various protocols used when writing web services including SOAP, WSDL, and other related protocols.
  
- **Java** - The Java API for XML Messaging (JAXM) provides a framework for sending and receiving SOAP messages.
  
- **c++** - EasySoap++ is a C++ library for SOAP.
  
4.22.8 SOAP API search Reference

The Search Appliance exposes three functions for searching: search, which performs a normal search, moreLikeThis, which finds similar pages, and showParents, which shows which pages link to a page.

There are some parameters that are standard to all the functions:

- **jump** - number of user-visible results to skip. 0 would return the first page of results, 10 the second page, etc. (assuming 10 results per page).
- **order** - specifies how the results should be ordered. Possible values are: 
  - r - sort by relevance (default) 
  - dd - newest pages first 
  - da - oldest pages first

**RankKnobs structure**

There’s an optional “rankKnobs” parameter for many of the functions that can specify how things should be ranked (each function notes whether it accepts rankKnobs). All of these can be set from 0-1000, where the higher the value, the more heavily that aspect is weighed; 500 is the default. These parameters correspond directly to the “Ranking Factors” settings on the Advanced Search page.

RankKnobs has the following parameters:

- **order** - importance of the words being in the proper order
- **proximity** - importance that the words are close together
- **dbFreq** - importance of the frequency of a word in the database
- **docFreq** - importance of the frequency of a word within the document
- **leadBias** - importance of closeness to the start of the document

**search**

This performs a normal search based on the query/queries provided.

Parameters:

- **profile** - Required. Specifies which profile you’re working with.
- **query** - Required. The Metamorph query to search for.

The following parameters can be provided to further refine the search:

- **urlQuery** - Used for URL Prefix queries. Corresponds to the default search interface’s uq query-string variable (p. 115).
• **depthQuery** - the maximum depth that would be allowed. Supplying a value of 3 would only return pages that are no more than 3 clicks away from a Base URL. Corresponds to the default interface’s `dq` variable.

• **categoryQuery** - numeric index for a category to use. 1 is the first category, etc. Corresponds to the default interface’s `cq` variable.

• **proximity** - specifies a required proximity for the words in the query. Corresponds to the default interface’s `prox` variable. Possible values are:
  - page - words must occur on the same page (default)
  - paragraph - words must occur in the same paragraph
  - sentence - words must occur in the same sentence.
  - line - words must occur on the same line.

The search function may also use the rankKnobs structure (section 4.22.8, p. 141).

The search function may also take a number of Additional Field parameters, as described in the Searching Additional Fields section (p. 32).

The output of the function is described in the XML Elements in Search Results section (5.6, p. 159).

**moreLikeThis**

moreLikeThis returns results that are similar to a result already found.

Parameters:

• **profile** - Required. Specifies which profile you're working with.

• **id** - Required. the id of a single URL, returned from a previous function.

The moreLikeThis function may also use the `<rankKnobs>` structure, as described in section 4.22.8, p. 141.

The output of the function is described in the XML Elements in the Search Results section (5.6, p. 159).

**showParents function**

showParents lists all the pages that link to a previous retrieved search results.

Parameters:

• **profile** - Required. Specifies which profile you're working with.

• **id** - Required. the id of a single URL, returned from a previous function.

The output of the function is described in the XML Elements in the Search Results section (5.6, p. 159).
4.22.9 SOAP API admin Reference

`login`

Parameters:

- `username` - the user being logged in
- `password` - the password for the user

Returns:

- `authToken` - an authentication token for use in further requests

`login` logs you in to the appliance, supplying you with an authentication token that will be included in all further requests to show that you’re logged in. All other Admin SOAP API calls require an authToken for use. It’s sent in further requests via a SOAP Header.

`listProfiles`

Parameters:

- `none`

Returns:

- `ProfileName` - an array of profile names requests

Returns a list of all profiles that currently exist on the appliance. If no profiles exist, a successful response with no ProfileNames is returned.

`getProfileStatus`

Parameters:

- `Profile` - name of the profile

Returns:

- `IsRunning` - whether or not the crawl is currently running, set to true or false.

Returns information about the profile, currently just whether or not the profile is running.
addProfile

Parameters:

- **Profile** - name of the new profile
- **Type** *(optional)* - the type of profile, standard or metasearch. Defaults to standard.
- **CopyOf** *(optional)* - name of the profile to copy
- **ParametricField** - unused in the Search Appliance
- **PrimaryKey** - unused in the Search Appliance
- **Dataspace** - unused in the Search Appliance

Returns:

- **Success** - will be set to ok, indicating the profile was created successfully.

Adds a new profile to the Search Appliance. If there’s any problem (already exists, invalid profile name, etc), a SOAP Fault will be thrown.

deleteProfile

Parameters:

- **Profile** - name of the profile to be deleted

Returns:

- **Success** - will be set to ok, indicating the profile was deleted successfully.

Deletes a profile from the Search Appliance. If the profile didn’t exist, the call will still succeed.

getSettings

Parameters:

- **Profile** - name of the profile
- **Name** *(optional)* - array of setting names to get. If no Name is provided, all settings are returned.
- **TestOrLive** *(optional)* - whether to return the test settings, or live settings. Returns live settings by default.
4.22. SOAP API

Returns:

- **Setting** - an array of name/value pairs for the requested settings. A `TestOrLive` attribute on the settings indicate whether this applies to test, live, or both.

Gets a list of settings for the requested profile. You can request one or more specific settings by passing in `Name` parameters, or get all settings by not supplying a `Name`.

Some settings have test and live versions. You can request which version you’d like (defaults to live), and the returned settings indicate whether they apply to test or live. “Both” indicates that setting doesn’t have different test and live versions.

**setSettings**

Parameters:

- **Profile** - name of the profile
- **TestOrLive (optional)** - whether this should apply to test settings, live settings, or both. Defaults to both.
- **Setting** - multiple name/value pairs of settings that you’d like to set

Returns:

- **Success** - set to ok, indicating the settings were set properly.

Applies an array of settings for the given profile.

If there is any problem (such as an invalid setting name) in any one of the settings, a SOAP Fault is returned, and NONE of the settings are applied. This allows you to tweak the problem settings, and re-submit the entire batch again, without having them “partially applied” in between.

**getThesauruses**

Parameters:

- **none**

Returns:

- **Thesaurus** - an array of Thesaurus information
  - **Name** - name of thethesaurus
  - **Permutations** - what permutations apply to this thesaurus
  - **NumProfileUsing** - the number of profiles that are currently using this thesaurus

Returns information about all thesauruses that exist in the Search Appliance.
setThesaurus

Parameters:

- **Name** - name of the thesaurus. If this thesaurus already exists, it will be replaced.
- **Permutations** - what permutations apply to this thesaurus. Possible values are Full, Single, or None.Defaults to Single.
- **Verbose (optional)** - If set to Y, verbose output of processing the thesaurus content will be included in the response.
- **Content** - the text content that should be used for the thesaurus. See the Thesaurus section for details on the format (4.3, p. 109).

Returns:

- **Output** - output of the thesaurus processing operation. Any errors will be listed in the text.

Creates or updates a thesaurus in the Search Appliance. Once created, a thesaurus can be used in a profile by setting its `SSc_eqprefix` or `SSc_ueqprefix` to this thesaurus’ Name.

deleteThesaurus

Parameters:

- **Name** - name of the thesaurus to delete

Returns:

- **Output** - output of the thesaurus deletion operation. Any errors will be listed in the text.

Deletes the thesaurus Name. Any profiles using this thesaurus will have their setting properly cleared.

### 4.23 Thunderstone ISAPI Proxy Module

#### 4.23.1 Overview

The Thunderstone ISAPI Proxy Module is an IIS add-on that allows you to proxy requests through another machine.

Users’ search requests are not made directly to the Search Appliance, but to the Proxy Module, which then passes the request along to the Search Appliance.

The Proxy Module also has an optional AuthProxy, which allows the use of automatic Active Directory credentials when authenticating the Search Appliance search results. Internet Explorer will be configured to automatically pass along the authentication information, allowing for Single Sign On. The Search Appliance communicates with the Proxy Module to authorize the results.
4.23. THUNDERSTONE ISAPI PROXY MODULE

4.23.2 Requirements

For the Proxy Module:

The Thunderstone Proxy Module must be installed on a machine with IIS.

For the Proxy Module with the authProxy:

The Proxy Module with authProxy requires IIS 6, which is only available on Windows 2003 or later. The machine will need to be added to Internet Explorer's Local Internet zone, so if you have a server already listed there, you may want to use it.

This must be a separate machine from the Search Appliance, and the machine the Proxy Module is installed on must be a member of the Active Directory domain.

Ensure that the machine that the authProxy is being installed on is a secure machine. Because the Proxy Module is dealing with authorization functionality, a user with Administrative privileges could potentially tamper with operations.

4.23.3 Installing the Proxy Module

Before installing the proxy module the only thing you need to know is:

- The full hostname of the Search Appliance machine (e.g. thunderstone.mysite.com) that the Proxy Module will be communicating with.

You can download the installer that contains the Proxy Module and authProxy from the Search Appliance machine by going to the Maintenance section, selecting Extra Downloads, then Thunderstone Proxy Module, and finally click the Download proxyModuleInstaller.exe link for the installer. Once downloaded, the installer must be run on the Windows machine that you wish to make the proxy.

When installing you will be asked for a few items:

- **Destination Location** - This is where the actual DLL for the proxy module and its supporting files are placed. The directory windows\system32\inetsrv is recommended by default.

- **Configuration Directory** - This is the path that will be used for the IIS virtual directory that the proxy module is assigned to. Its actual location does not matter, as the proxy module will intercept all requests, but IIS still requires that all virtual directories point to a real path. The directory Program Files\Thunderstone Software\Thunderstone ISAPI Proxy Module is suggested by default.

- **Target** - The full hostname of the Search Appliance machine that this Proxy Module should connect to.

- **Active Directory Authentication** - If the Target you entered supports using the authProxy, you will be asked if you’d like to use Active Directory Authentication.
If you are using the Proxy Module simply to allow access to the Search Appliance through the proxy, choose "No".

If you're using the Proxy Module to enable Single Sign On behavior in an Active Directory environment, choose "Yes".

4.23.4 Post-Install Setup

If you're using the authProxy, there are some configuration steps that must be manually performed, as they occur on machines other than the Proxy Module’s machine. Please perform these before attempting to use the Proxy Module with authProxy.

Grant “Trust for Delegation” to the proxy machine

The machine that runs the Proxy Module & authProxy must be marked as trusted for delegation by the Active Directory domain controller. This is necessary for the proxy to automatically “pass along” the users’ authentication to the searched web sites.

- **On the domain controller**, go to Start - Programs - Administrative Tools - Active Directory Users and Computers.
  - Choose Computers on the left.
  - Locate the computer that is running the Proxy Module, right-click on it, and choose Properties.
  - Check Trust computer for delegation. A message box warning you that “this is a security-sensitive operation and it should not be done indiscriminately” will pop up. Click OK.
  - Click OK to close the machine’s properties, and close the Active Directory Users and Computers window.

Configuring Internet Explorer for Passing Credentials

The Proxy Module & authProxy machine must be listed in Internet Explorer's Local Internet security zone for all computers using it in order to function properly. If it is not in the Local Internet, then credentials will not be automatically provided. Even if the credentials are entered manually, the Proxy Module cannot authenticate with results when not listed in Internet Explorer's Local Internet.

If the Proxy Module machine is already in the Local Internet settings, you may skip this step.

The following steps adds the Proxy Module machine to Internet Explorer’s Local Internet:

- Start Internet Explorer.
  - Choose Tools from the menu, and select Internet Options.
  - Choose the Security tab.
4.23. **THUNDERSTONE ISAPI PROXY MODULE**

- Choose Local Internet from the list of zones.
- Click the Sites button to edit the local internet.
- Click Advanced to manually add a site.
- **Uncheck** Require server verification (https:) for all sites in this zone.
- Enter the full hostname of your proxying machine, for example proxyMachine.example.com.
- Click Add to add the site to the Trusted Sites.
- Click Close to close the Advanced window.
- Click OK to close the Local Intranet window.
- Click OK to close the Internet Options window.

Internet Explorer is now configured to pass credentials to the proxy machine. This is a per-user configuration, and will need to be configured for any user that is authenticating via the Proxy Module.

**Configuring the Search Appliance**

There are three things that must be done in the Search Appliance to configure it to accept authentication information from the authProxy, one of them global and two on a per-profile basis.

**Add the Proxy Machine to Cluster Members**

The IP address of the machine that the authProxy is installed on must be added to the list of Cluster Members to tell the Search Appliance to trust the proxy machine.

- Choose Maintenance on the left.
- Choose System Wide Settings, under the Search Appliance Settings section.
- Enter the proxy machine’s IP address in the Cluster Members field on a new line.

**Make the Target Profiles Visible**

The profiles that you want to search with the authProxy must be set Visible, which enables the profile for things like meta searching and the proxy module.

- Select the profile in the Profiles page.
- Choose Search Settings on the left.
- Set the Visible setting to Y.
- Click Update at the bottom.
Enable Results Authorization for the Target Profile

Also, Results Authorization must be enabled for the target profile, if it’s not already enabled.

- Select the profile in the Profiles page.
- Choose Search Settings on the left.
- Set the radio button for Authorization Method to Basic/NTLM/file (occurs beneath Login Cookies and Login URL).
- Click Update at the bottom.

4.23.5 Manually Configuring the Proxy Module

This section describes how to manually configure IIS for use of the Thunderstone Proxy Module. The will be described in more detail in the next section. This is not necessary for normal operations - these actions are normally performed automatically by InstallShield upon installation. These steps are only necessary if IIS’s configuration gets wiped out and needs to be redone.

The Thunderstone Proxy Module is an ISAPIExtension, two if using the authProxy. They are assigned as Global Application Maps to Virtual Directories in IIS. All requests to the directories are not be served from the file system that the virtual directory points to, but instead go through the Proxy Module dlls.

One virtual directory is required per extension: texis, which gets assigned proxyModule.dll, and authProxy, which gets assigned authProxy.dll.

If using the authProxy, texis must have anonymous access disabled and Integrated Authentication enabled, while authProxy must have anonymous access allowed (which is allowed by default).

These are the steps that must be done if you are manually setting up IIS for using the Proxy Module. Note that these are done automatically by the InstallShield wizard and do not need to be manually done under normal circumstances.

- Open the IIS Configuration
  - Right click on My Computer on the desktop.
  - Select Manage...
  - Open Services and Applications in the tree.
  - Open Internet Information Services.
  - Open Web Sites.
  - Select the web site you want to add the Proxy Module to (most likely Default Web Site).
- Add the texis virtual directory
  - Right click on the web site and select New -> Virtual Directory...
  - The Virtual Directory Creation Wizard opens. Click Next>.
4.23. **THUNDERSTONE ISAPI PROXY MODULE**

- **In the Alias box, enter texis and click Next>**.
- **In the Path box, enter the real physical path you want the virtual directory to map to, and click Next.** The Proxy Module uses the directory `<INSTALLDIR>/etc/ISAPI-virtualdir` by default. Note that it doesn’t matter what directory is selected. This directory will never be used because all requests will be intercepted by the Proxy Module. The only reason a directory must be selected is because IIS insists that all virtual directories map to a real physical location.
- **At the Virtual Directory Access Permissions screen, just click Next** to complete the wizard, as we won’t be using any of the permissions.
- **Click Finish to complete the wizard and return to the Computer Management window.**

**• Apply proxyModule.dll as a Wildcard Application Map**

- Right-click on the newly created virtual directory and select Properties.
- The lower half of the properties window is labeled Application Settings. Click Create to make a custom set of application settings for this virtual directory.
- After clicking Create, the Configuration should no longer be disabled. Click Configuration.
- The lower half of the new Application Configuration window details Wildcard Application Maps, which is currently empty. Click Insert.
- Next to the Executable field, click the Browse button and locate ProxyModule.dll, which is in the directory you installed the Proxy Module to.
  
  *(The default location for this file in C:\windows\system32\inetsrv on 32bit windows, C:\windows\SysWOW64\inetsrv on 64bit windows.)*
- **Uncheck** the box next to Verify that file exists, and click OK.
- ProxyModule.dll will now be in the list of Wildcard Application Maps. Click OK to close the Application Configuration window.

**• Configure texis for authentication**

**Only necessary if using the authProxy.**

- While still in the texis Properties window for the new virtual directory, Select the Directory Security tab.
- In the top section, labeled Authentication and Access Control, click the Edit... button.
- **Uncheck** Enable Anonymous Access and ensure that Integrated Windows Authentication is checked.
- Click OK to close the Authentication Methods window.
- **Click OK to close the texis Properties window.**

Now we need to create the authProxy directory in a similar manner, although it doesn’t need anonymous access disabled.

**If you’re not using the authProxy, please skip to the "Add the Proxy Module files to IIS’ list of allowed extensions" section below.**
Add the authProxy virtual directory

- Right click on the website and select New -> Virtual Directory...
- The Virtual Directory Creation Wizard opens. Click Next>
- In the Alias box, enter authProxy and click Next>
- In the Path box, enter the real physical path you want the virtual directory to map to, and click Next. The Proxy Module uses the directory <INSTALLDIR>/etc/ISAPI-virtualdir by default.
  Note that it doesn’t matter what directory is selected. This directory will never be used because all requests will be intercepted by the Proxy Module. The only reason a directory must be selected is because IIS insists that all virtual directories map to a real physical location.
- At the Virtual Directory Access Permissions screen, just click Next to complete the wizard, as we won’t be using any of the permissions.
- Click Finish to complete the wizard and return to the Computer Management window.

Apply authProxy.dll as a Wildcard Application Map

- Right-click on the newly created authProxy virtual directory and select Properties.
- The lower half of the properties window is labeled Application Settings. Click Create to make a custom set of application settings for this virtual directory.
- After clicking Create, the Configuration should no longer be disabled. Click Configuration.
- The lower half of the new Application Configuration window details Wildcard Application Maps, which is currently empty. Click Insert.
- Next to the Executable field, click the Browse button and locate authProxy.dll, which is in the directory you installed the Proxy Module to.
  * (The default location for this file in C:\windows\system32\inetsrv on 32bit windows, C:\windows\SysWOW64\inetsrv on 64bit windows).
- Uncheck the box next to Verify that file exists, and click OK.
- authProxy.dll will now be in the list of Wildcard Application Maps. Click OK to close the Application Configuration window.

Add the Proxy Module files to IIS’ list of allowed extensions

By default IIS blocks all ISAPI extensions as a security measure. The Proxy Module must be explicitly allowed in IIS’ configuration.

- Back in the Computer Management window, open Web Service Extensions, underneath Internet Information Services.
- The right side of the window should now have a list of rules. Right-click beneath the existing rules and select Add a new web service extension...
- In the Extension Name field, enter Thunderstone Proxy Module.
- Next to the Required files text area, click the Add... button.
4.23. THUNDERSTONE ISAPI PROXY MODULE

- Next to Path to file:, click Browse... and locate ProxyModule.dll, (just as in the previous set of instructions), and click OK to close the Add File dialog.
- If using the authProxy, click Add again, and this time choose the authProxy.dll file.
- Check the box next to Set extension status to Allowed, and click OK to close the window.

IIS is now set up properly to use the Proxy Module. Note that if using the authProxy, changes still need to be made to the network and the Search Appliance, as detailed in the Post-Install Setup and Configuring the Search Appliance sections, on pages 148 and 149, respectively.

4.23.6 Troubleshooting the Proxy Module Authentication

This section details some troubleshooting steps you can go through if Proxy Module Authentication isn’t working.

Review Installation Steps

There are a number of steps that must be manually performed after the Proxy Module install (due to them being done on different machines or as different accounts). Please ensure the following steps have been performed:

- Grant “Trust for Delegation” to the proxy machine (p. 148)
- Configuring Internet Explorer for Passing Credentials (p. 148)
- Configuring the Search Appliance (p. 149)

Machine names and SPNs

A Service Principle Name (SPN) is the name by which a client uniquely identifies an instance of a service. By default your IIS machine has SPNs for its hostname, such as myServer, and its Fully Qualified Domain Name (FQDN), such as myServer.branch.example.com.

If the proxy machine is accessed by a name other than either of these, such as myServer.example.com, otherName.company.com, or its IP address, then Active Directory authentication will not work. Your choices are:

- Access the machine using either its host name or FQDN.
- Register an additional SPN for the proxy machine on the domain controller.

SPNs can be viewed and changed with the setspn.exe tool, which Microsoft provides as part of its Windows 2003 Support Tools. This package is available on the Windows 2003 CD, or, at the time of writing, at http://go.microsoft.com/fwlink/?LinkId=100114.
DelegConfig Diagnostic Tool

For general Active Directory troubleshooting, Thunderstone has found the DelegConfig tool to be handy. It’s an ASP.NET application used to help troubleshoot and configure IIS and Active Directory to allow Kerberos and delegating Active Directory credentials. At the time of this writing, it is available at:

http://www.iis.net/downloads/default.aspx?tabid=34&g=6&i=1434

Thunderstone did not create DelegConfig, and does not make any guarantees to its accuracy or availability.

Launch IE as a different user

When testing multiple user accounts, you can Right-Click on an Internet Explorer shortcut, select Run As..., and enter another user’s credentials to launch Internet Explorer as that user. This way you can try out IE as them without needing to go through the full login process.

- Note that the user you run IE as must have logged in at least once in order to properly configure IE, otherwise the Add to Local Internet dialog will not function properly.
- If there is no Run As... option, create a new shortcut to Internet Explorer and use that - the IE icon on that’s on the desktop by default is not a normal shortcut.
- You cannot test another user by entering their credentials within the browser when accessing the proxy machine. Credentials MUST be passed to the proxy machine automatically by IE by having the proxy machine in IE’s Local Internet settings.

If credentials are entered manually in IE when accessing the proxy machine (even the credentials of the current user), then IE will use NTLM to authenticate with the proxy machine instead of Active Directory, which prevents proper delegation from occurring.
Chapter 5

Reference

5.1 Database and File Usage

The Search Appliance maintains a database that contains text from HTML pages, links to other pages, and a list of categories.

When the Search Appliance walker runs it creates a new database, under your specified data directory, to hold the new walk. It then dispatches a separate process for each web site it needs to visit and another to handle all of the “Single Pages”. Each of these retrieves all of the pages in it’s base list and stores the text of the HTML page to the html table and the hyperlinks to the refs table. All of the desirable URLs from the page that have not been seen before are placed into an internal “todo” list. After all of the base URLs are processed the process repeats with the internal todo list. When there’s nothing left in the todo list processing is complete.

Once all of the walking is complete the indices needed for searching are created on the data. Then the new database is flagged as the “live” one and the old database is deleted. Therefore your disk must have sufficient space for 2 complete databases plus temporary space used during the indexing step.

The databases are called db1 and db2. The Search Appliance alternates between using these two names.

Note that the above applies to a walk type of New. During a walk type of Refresh only one database, the “live” one, is used.

The Search Appliance also maintains a file containing the detailed report for each walk. This file has the same name as the database with .long appended to the end. Also, a single file called summary is maintained with short summary information about the state of the database.

Given a data directory named .../default there may also be the following:

.../default/db1 an actual walk database
.../default/db2 an actual walk database
.../default/db1.long detailed walk report. Displayed when viewing Walk Status
.../default/db2.long detailed walk report. Displayed when viewing Walk Status
.../default/summary summary walk report. Displayed as Walk summary when viewing Walk Settings

Each setting has a record in the options table of the default database. See section 5.3 (p. 158) for the list of fields in the table. At each complete rewalk the current options settings are copied into an options table in the walk database. These options are not changed as settings are modified and are not otherwise used unless a search is performed setting the database with db instead of setting the profile with pr.

5.2 Walk Database Tables and Fields

Table 5.1: Fields in html table

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Unique record id</td>
</tr>
<tr>
<td>Hash</td>
<td>Document hash for duplicate content detection</td>
</tr>
<tr>
<td>Size</td>
<td>Size of retrieved raw document (i.e. HTML)</td>
</tr>
<tr>
<td>Visited</td>
<td>The date the page was modified (or fetched if modified not set)</td>
</tr>
<tr>
<td>Dlsecs</td>
<td>The number of seconds needed to fetch the page</td>
</tr>
<tr>
<td>Depth</td>
<td>The number of URLs traversed to reach the page</td>
</tr>
<tr>
<td>Url</td>
<td>The URL of the real HTML page</td>
</tr>
<tr>
<td>Title</td>
<td>The title of the page</td>
</tr>
<tr>
<td>Body</td>
<td>The formatted textual content of the page, in Storage Charset (UTF-8)</td>
</tr>
<tr>
<td>Keywords</td>
<td>The keywords meta data from the page</td>
</tr>
<tr>
<td>Description</td>
<td>The description meta data from the page</td>
</tr>
<tr>
<td>Meta</td>
<td>Other meta data from the page, separated by newlines</td>
</tr>
<tr>
<td>Catno</td>
<td>List of categories to which the URL belongs</td>
</tr>
<tr>
<td>CatnoLowest</td>
<td>Lowest Catno value</td>
</tr>
<tr>
<td>Modified</td>
<td>The date the page was modified</td>
</tr>
<tr>
<td>NextCheck</td>
<td>The date the page should next be refreshed</td>
</tr>
<tr>
<td>Views</td>
<td>The number of times this URL has been viewed (shown in results)</td>
</tr>
<tr>
<td>Clicks</td>
<td>The number of times this URL has been clicked (in results)</td>
</tr>
<tr>
<td>CTR</td>
<td>Click-through ratio</td>
</tr>
<tr>
<td>Pop</td>
<td>Popularity (number of pages linking to this page)</td>
</tr>
<tr>
<td>MimeType</td>
<td>MIME type of original page</td>
</tr>
<tr>
<td>Charset</td>
<td>Character set of page as stored (usually Storage Charset)</td>
</tr>
</tbody>
</table>

Table 5.2: Fields in refs table

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Url</td>
<td>The URL of the HTML page</td>
</tr>
<tr>
<td>Ref</td>
<td>The URL of a reference (link) on the HTML page</td>
</tr>
</tbody>
</table>
### Table 5.3: Fields in `categories` table

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catno</td>
<td>The number for the category</td>
</tr>
<tr>
<td>OverlapsLower</td>
<td>Y if some member(s) also in a lower category</td>
</tr>
<tr>
<td>Url</td>
<td>The URL pattern for the category</td>
</tr>
<tr>
<td>Category</td>
<td>The name of the category</td>
</tr>
</tbody>
</table>

### Table 5.4: Fields in `error` table

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Url</td>
<td>The URL of an HTML page that could not be retrieved</td>
</tr>
<tr>
<td>Reason</td>
<td>The reason it could not be retrieved</td>
</tr>
<tr>
<td>id</td>
<td>Unique record id (includes timestamp info).</td>
</tr>
</tbody>
</table>

### Table 5.5: Fields in `querylog` table (if query logging enabled)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Contains the date and time of the query (unique record id)</td>
</tr>
<tr>
<td>Client</td>
<td>The hostname of the web client that performed the query</td>
</tr>
<tr>
<td>Query</td>
<td>The user’s query as entered</td>
</tr>
</tbody>
</table>
5.3 Options Table Fields

These are the options table fields (maintained in the default database):

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Unique id for the record</td>
</tr>
<tr>
<td>Profile</td>
<td>The name of the profile that the record belongs to</td>
</tr>
<tr>
<td>Name</td>
<td>The name of the setting</td>
</tr>
<tr>
<td>Type</td>
<td>The data type of the setting (always String)</td>
</tr>
<tr>
<td>String</td>
<td>The value of the setting</td>
</tr>
<tr>
<td>Int</td>
<td>Unused</td>
</tr>
<tr>
<td>Float</td>
<td>Unused</td>
</tr>
<tr>
<td>Strlist</td>
<td>Unused</td>
</tr>
</tbody>
</table>
5.4 Customizing the Search

You may make common changes to the Search Appliance’s search appearance by using Search Settings from the administrative interface main menu.

5.5 Customizing the Walker

You may make many changes to the Search Appliance’s walk behavior by using Walk Settings from the administrative interface main menu.

5.6 XML Elements in Search Results

Search results can be sent as XML from the Search Appliance to the host server. This section describes the XML elements. The elements are listed below in the approximate order that they are sent.

- `<?xml version="1.0"?>` The version of this XML.
- `<ThunderstoneResults>` Root element that encloses all results.
- `<ResultsFromCache>` Included in `<XmlOutputVersion> 1.04` and later. Y if this result set is from the results cache.
- `<Query>` Main text search string that was submitted by user.
- `<TitleQuery>` User’s title query
- `<UrlQuery>` User’s Url query
- `<DepthQuery>` User’s maximum depth specified
- `<CategoryQuery>` User’s category query
- `<ResultsPerPageQuery>` User’s max-results-per-site number.
- `<TextQuery>` The text part of the query (sans `site:`
- `<TextQueryHighlight>` The text part of the query, with query highlighting (if enabled). Included in `<XmlOutputVersion> 1.05` and later.
- `<SiteQuery>` The site query (from `site:host` or the `sq` form variable).
- `<ModifiedDateLessThan>` The `mdlt` query used, if any.
- `<ModifiedDateGreaterThan>` The `mdgt` query used, if any.
- `<UrlRoot>` The URL root of the search script.
- `<Profile>` The profile used.
• `<dropXSL>` If yes removes XSL from results.
• `<AdvancedSearch>` 1 if an advanced search form should be printed.
• `<Proximity>` What the proximity for the search was (line, sentence, paragraph, page)
• `<Suffixes>` What suffix processing occurred in the search
  – 0 - no suffix processing
  – 1 - plurals and possessives
  – 2 - all word forms
• `<Thesaurus>` 1 indicates the thesaurus was used.
• `<Order>` How the search was ordered.
  – r - by rank
  – dd - by date, descending
  – da- by date, ascending
• `<RankOrder>` The ranking weight of word order, from 0-1000
• `<RankProximity>` The ranking weight of query word proximity, from 0-1000
• `<rankDatabaseFrequency>` The ranking weight of rarity of words in the database, from 0-1000
• `<RankDocumentFrequency>` The ranking weight of frequency of words in the document, from 0-1000
• `<RankPosition>` The ranking weight of position in the document, from 0-1000
• `<RankDepth>` The ranking weight of depth of the document, from 0-1000
• `<mode>` set to `admin` if this is an admin search
• `<opts>` Internal use only.
• `<metasearchTarget>` Indicates what backend metasearch targets are available, one element for each target. Currently selected targets will have a `selected="selected"` attribute.
• `<AdminUrl>` The URL to the admin version of the search interface
• `<MakeLiveUrl>` The URL to make this look and feel live
• `<authUser>` The user that was authenticated via the Proxy Module.
• `<Category>` Information about what categories are available. Occurs multiple times.
  – `<CatVisible>` Set to Y if the category should be selectable in the list of categories.
  – `<CatSel>` Set to Y if this category is currently selected.
  – `<CatVal>` The numeric ID associated with this category, used for the select box.
  – `<CatName>` The displayed name for this category.
5.6. XML ELEMENTS IN SEARCH RESULTS

- `<TopBestBets>` Contains information on the BestBets that display above the results.
  - `<BBTitle>` The title for this section of BestBets
  - `<BestBet>` The list of BestBets in this group
    * `<BBResultNum>` The ordered numbering for this Best Bet, starting at 1.
    * `<BBPriority>` The priority for this BestBet, as assigned in the admin interface. The Best bets will already be in the proper priority order.
    * `<BBLink>` The URL that this BestBet links to.
    * `<BBLinkDisplay>` The URL that displays for this BestBet. Long URLs are intelligently truncated for display.
    * `<BBResult>` The link text for this individual BestBet, as assigned in the admin interface.
    * `<BBDescription>` The description for this individual BestBet, as assigned in the admin interface.
    * `<BBGroupName>` The name of the BestBet group this BestBet belongs to.
    * `<BBGroupId>` The id of the BestBet group this BestBet belongs to.
    * `<BBKeywords>` The keywords that trigger this BestBet record to display. This is all keywords for this individual record, not just the one that triggered this activation.

- `<ProfileInfo>` Encloses some profile summary info. Child elements include:
  - `<Profile>` The profile to which the `<ProfileInfo>` element refers to.
  - `<ExitIsEarly>` Y if search abort (`<UserResultsNum>` may be short), N if not.
  - `<ExitReason>` ok if search finished, otherwise token indicating reason (see table of reasons below).
  - `<RedirectUrl>` If present, external URL to redirect the user to. E.g. the external Login URL for Results Authorization, to get third-party login cookies.
  - `<LoginUrl>` If present, local URL to login with rauser/rapass for Results Authorization.

- `<Summary>` Encloses search results summary; only sent if a query was actually performed. Child elements include:
  - `<Profile>` The profile that the `<Summary>` element applies to.
  - `<Start>` First result item to list.
  - `<End>` Last result item to list.
  - `<TotalNum>` Total number of result items found, before ResAuth etc.
  - `<TotalIsEstimate>` Y if `<TotalNum>` is an estimate, N if not.
  - `<TotalIsShort>` Y if `<TotalNum>` is short (e.g. early exit), N if not
  - `<UserResultsNum>` Total number of result items found, after ResAuth etc.
  - `<UserResultsIsEstimate>` Y if `<UserResultsNum>` is an estimate, N if not.
  - `<UserResultsIsShort>` Y if `<UserResultsNum>` is short (e.g. early exit), N if not.
  - `<ResultsAuthorization>` Y if Results Authorization used for query, N if not.
  - `<Total>` Readable text for total number of results, after ResAuth etc.
- `<GroupBySite>` Y if Results per Site was used with this query.
- `<CurOrder>` Text that describes the order by which results are listed.
- `<OrderLink>` Link that provides an alternative sorting order results list.
- `<OrderType>` Text that describes `<OrderLink>`.
- `<NewSkip>` (Metasearch only) The skip value to use for any further request. Only needed with the SOAP API.
- `<PreviousLink>` Link to the previous page of results (current page minus 1).
- `<FirstPage>` 1 if this is the first page of results, 0 if later page.
- `<Pages>` Tag that groups tags for a specific page of results. Child elements include:
  * `<PageLink>` Link to a certain page of the results.
  * `<PageNumber>` Page number a page of results.
- `<NextLink>` Link to the next page of results (current page plus 1).
- `<LastPage>` 1 if this is the last page of results, 0 if earlier page.
- `<Credit>` Text to introduce credit image.
- `<CreditImage>` The URL of credit image.

- `<Result>` Tag that contains all elements for a given result. Child elements include:
  * `<Profile>` Name of the profile for this `<Result>`. Note that results from meta-search back-ends are re-labeled to the front-end profile.
  * `<Num>` Number of this result item.
  * `<Skip>` Internal use: raw skip(s) for result. Valid for Meta Search back-ends.
  * `<Id>` Identifier for this result item.
  * `<ResultTitle>` Title of the page of this result item.
  * `<Url>` The URL of the page for this result item.
  * `<ClickUrl>` The URL for this result item, as should be clicked by the user. The default (if not present) is `<Url>`. Only sent if Query Logging is enabled, in which case it contains redirect for logging the click-through.
  * `<UrlPDFHi>` The URL to highlight this PDF item in user’s Acrobat Viewer.
  * `<UrlDisplay>` Displayed URL for this result item.
  * `<RawRank>` The raw relevance rank value for this result item (0-1000).
  * `<ScaledRank>` Raw rank scaled up for a more-like-this search (0-1000).
  * `<PercentRank>` ScaledRank as a percentage (0-100).
  * `<DocSize>` Size (bytes) of the page of this result item.
  * `<Depth>` Number of links walked from Base URL to this URL.
  * `<UrlSimilar>` The URL to search for pages similar to this result item.
  * `<UrlInfo>` The URL for context of answers within a matching document.
  * `<UrlParents>` The URL of pages that link to the page of this search result item.
  * `<Modified>` Date and time that the page of this result item was last modified.
– `<Visited>` Date and time that the page of this result item was crawled.
– `<Abstract>` Brief text surrounding the matched word or phrase.
– `<Charset>` Character set of the formatted text of the page (typically Storage Charset unless conversion failure).
– `<SiteName>` The name of the site for this result item.
– `<UrlMoreResultsFromSite>` The URL for more results from this site.

The following table lists the possible value tokens for the `<ExitReason>` element:

<table>
<thead>
<tr>
<th>Token</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ok</td>
<td>Normal exit</td>
</tr>
<tr>
<td>ResAuth-ExternalLoginRequired</td>
<td>Need Login Cookies: redirect to <code>&lt;RedirectUrl&gt;</code></td>
</tr>
<tr>
<td>ResAuth-CredentialsRequired</td>
<td>Need user/pass: send <code>rauser/rapass</code> to <code>&lt;LoginUrl&gt;</code></td>
</tr>
<tr>
<td>ResAuth-LoginIncorrect</td>
<td>User/pass incorrect; re-send to <code>&lt;LoginUrl&gt;</code></td>
</tr>
<tr>
<td>ResAuth-SuccessLimit</td>
<td>Successful Auth Result Limit reached</td>
</tr>
<tr>
<td>ResAuth-Timeout</td>
<td>Results Authorization timeout</td>
</tr>
<tr>
<td>ResAuth-MaxDocsCheck</td>
<td>Max Docs to Auth-Check exceeded</td>
</tr>
<tr>
<td>ResAuth-SmbError</td>
<td>SMB error</td>
</tr>
<tr>
<td>ResAuth-NoSmb</td>
<td>SMB unavailable/could not be run</td>
</tr>
</tbody>
</table>
Chapter 6

Search Interface Help

6.1 Forming a Query

The Search Appliance’s search can be as simple or as complex as you need it to be. Usually you will just need to enter a few words that best describe that which you are trying to locate. To perform more complicated searches you might use any combination of logic operators, special pattern matchers, concept expansion, or proximity operations.

Example: nature conservation organization

6.1.1 Query Rules of Thumb

- If you get too many junk or nonsense answers, try:
  - Add some more words to your query.
  - Decrease the range of the Proximity control.
  - Change the Word Forms control to Exact.
  - Look at the Match Info and see why they are showing up.
  - Use the Exclusion Operator (−) to remove unwanted terms.
  - If you are searching for a phrase, hyphenate the words together.

- If you don’t get any answers, or just too few:
  - Remove some more words to your query.
  - Examine your spelling.
  - Increase the scope of the Proximity control.
  - It just might not be there?
6.1.2 Overview of Query Abilities

The Search Appliance is based on TeXis and as such it shares its text query abilities with all of Thunderstone’s products. Throughout our documentation you will see references to Metamorph or TeXis. This is because all of our products share a common text query language. This document provides only a brief overview of this language.

If you’d like to know more see the online manual at http://www.thunderstone.com/site/texisman/link_mmq.html.

6.1.3 Controlling Proximity

Mastering the usage of proximity gives the ability to locate answers with greater precision. The Search Appliance input form gives you several options to control the search proximity:

- **line**: All query terms must occur on the same line
- **sentence**: Query items should all reside within the same sentence
- **paragraph**: Within the same paragraph or text block
- **page**: All items must occur within same HTML document (the default)

A bar-graph display will be shown any time a ranking search was performed (e.g. all searches except Show Parents).

6.1.4 Ranking Factors

The ranking algorithm takes into consideration relative word ordering, word proximity, database frequency, document frequency, and position in text. The relative importance of these factors in computing the quality of a hit can be altered under RANKING FACTORS on the Options page.

6.1.5 Keywords Phrases and Wild-cards

To locate words, just type them in as you would in a word processor. Letter cases will be ignored.

The wild-card character * (asterisk) may be used to match just the prefix of a word or to ignore the middle of something.

If the item you wish to locate is more complicated than the simple * wild-card can accomplish, try using the regular expression matcher (http://www.thunderstone.com/texis/site/pages/regexp.html).

To locate a number of adjacent words in a specific order, surround them with " (double quotation) characters. Putting a – (hyphen) between words will also force order and one word proximity.

* see Word Forms (6.2, p. 169)


### Table 6.1: Query examples

<table>
<thead>
<tr>
<th>Query</th>
<th>Locates</th>
</tr>
</thead>
<tbody>
<tr>
<td>john</td>
<td>john, John</td>
</tr>
<tr>
<td>&quot;john public&quot;</td>
<td>John Public</td>
</tr>
<tr>
<td>web-browser</td>
<td>Web browser, web-browser</td>
</tr>
<tr>
<td>John*Public</td>
<td>John Q. Public, John Public</td>
</tr>
<tr>
<td>456<em>a</em>def</td>
<td>1-456-789-ABCDEF</td>
</tr>
<tr>
<td>activate</td>
<td>activate, activation, activated, ... *</td>
</tr>
</tbody>
</table>

### 6.1.6 Applying Search Logic

Texis and Metamorph use set logic for text queries. Set logic is easier to use and provides more abilities than boolean. The examples below make reference to single keywords, but keep in mind that each keyword can represent an entire list of things or any of the special pattern matchers.

Sets (or lists) of things are specified by placing the elements within parenthesis, separated by commas. Example: (bob,joe,sam,sue). In the examples below, you could replace any of the keywords with a list like this.

The default behavior of the search is to locate an intersection (or ’AND’) of every element within a query. This means that the query: “microsoft bob interface” is the equivalent to the boolean query: “microsoft AND bob AND interface”.

- (without) The – (minus) is the most commonly used logic symbol. It means the answer should EXCLUDE references to that item.

+ (mandatory) The + (plus) symbol in front of a search item means that the answer MUST INCLUDE that item. This is generally used in conjunction with the permutation operation.

@N (permute) The @ followed by a number indicates how many intersections to locate of the terms in your query. This may be confusing at first, but it is very powerful.

<table>
<thead>
<tr>
<th>Query</th>
<th>Finds</th>
</tr>
</thead>
<tbody>
<tr>
<td>bob sam joe</td>
<td>Bob with Sam and Joe</td>
</tr>
<tr>
<td>bob sam -joe</td>
<td>Bob with Sam without Joe</td>
</tr>
<tr>
<td>bob sam joe @1</td>
<td>Bob with Sam, or Bob with Joe, or Joe with Sam</td>
</tr>
<tr>
<td>A B C D @1</td>
<td>AB or AC or AD or BC or BD or CD</td>
</tr>
<tr>
<td>+A B C D @1</td>
<td>ABC or ABD or ACD</td>
</tr>
<tr>
<td>A B C -D @1</td>
<td>( AB or AC or BC ) without D</td>
</tr>
</tbody>
</table>
The plus(+) and minus(−) operators must be attached to the term to which they apply. There must be a space between the operator and any preceding term.

- Correct
  - bob + sam - joe
- Incorrect
  - bob + sam - joe
  - bob+sam-joe

### 6.1.7 Natural Language Query

You may enter a query in the form of a sentence or question. The software will automatically identify the important words and phrases within your query and remove the “noise words”.

**Example:** What is the state of the art in text retrieval?

**The software will search for:** state of the art AND text AND retrieval

### 6.1.8 Using the Special Pattern Matchers

These pattern matchers are used to locate hard-to-find items within text:

- Regular expression matching for complex patterns

- Approximate pattern matching for fuzzy searches

- Numeric pattern matching for finding quantities

If improperly used these pattern matchers can slow queries. Therefore they require other keyword(s) in the query and are disabled entirely under Page proximity. For more details see the Vortex manual on Query Protection ([http://www.thundersone.com/site/vortexman/link_qprot.html](http://www.thundersone.com/site/vortexman/link_qprot.html)).

<table>
<thead>
<tr>
<th>Query</th>
<th>Matcher</th>
<th>Finds</th>
</tr>
</thead>
<tbody>
<tr>
<td>ronald %regan</td>
<td>Approx</td>
<td>Ronald Raygun, Ronald Re-an, Ronald Reagan</td>
</tr>
<tr>
<td>%75MYPARTNO9045d/6a</td>
<td>Approx</td>
<td>Anything within 75% of looking like MYPARTNO9045d/6a</td>
</tr>
<tr>
<td>/[1-9]{3}=[0-9]{4}</td>
<td>RegExpr</td>
<td>Phone numbers: 555-1212, 820-2200</td>
</tr>
<tr>
<td>#87</td>
<td>Numeric</td>
<td>four score and seven, 87</td>
</tr>
<tr>
<td>#&gt;0&lt;1</td>
<td>Numeric</td>
<td>Fractions like 9/16, 55%, 0.123, 15 nanoseconds</td>
</tr>
</tbody>
</table>
6.2. USING WORD FORMS

Table 6.4: Word Form Examples

<table>
<thead>
<tr>
<th>Word</th>
<th>Exact</th>
</tr>
</thead>
<tbody>
<tr>
<td>president</td>
<td>president</td>
</tr>
<tr>
<td>(above) + presidents</td>
<td>president’s</td>
</tr>
<tr>
<td>(above) + presidential presidency</td>
<td>preside</td>
</tr>
<tr>
<td>presides</td>
<td>presiding</td>
</tr>
<tr>
<td>presided</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Word</th>
<th>Plural &amp; Possessives</th>
</tr>
</thead>
<tbody>
<tr>
<td>tight</td>
<td>(above) + tights</td>
</tr>
<tr>
<td>(above) + tightly tightening</td>
<td>tightened</td>
</tr>
<tr>
<td>tightened</td>
<td>tighter</td>
</tr>
<tr>
<td>tightest</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Word</th>
<th>Any Word Forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>program</td>
<td>(above) + programs</td>
</tr>
<tr>
<td>program’s</td>
<td>programmatic</td>
</tr>
<tr>
<td>programmed</td>
<td>programmer</td>
</tr>
<tr>
<td>programmable</td>
<td></td>
</tr>
</tbody>
</table>

6.1.9 Invoking Thesaurus Expansion

The Search Appliance has a vocabulary of over 250,000 word and phrase associations. Each entry is generally classifiable by either its meaning or part of speech.

Depending on the administrator’s Synonyms setting for this profile, synonyms may already be included for each term in your query. If not, synonyms may be included for individual terms within your query by preceding them with a ~ (tilde) character.

6.2 Using Word Forms

The Word forms options give you control over how many variations of your query terms will be sought in your search.

**Exact:** Only exact matches will be allowed. (the default)

**Plural & possessives:** Plural and possessive forms will be found. (s, es, ’s)

**Any word forms:** As many word forms as can be derived will be located.

We call this morpheme processing, and it is generally smarter than a traditional “stemming” algorithm. It doesn’t just rip the end off a word, it actually checks to see if it could be a valid form of the search term.


Notes: Thesaurus terms are also treated in the same manner. Words smaller than 4-5 characters will not be morpheme processed.
6.3 Controlling Proximity

These options give you control over the region in which a match must be found.

**line:** match terms must be located within the same line.

**sentence:** all terms within the same sentence.

**paragraph:** match terms must be located within the same paragraph.

**page:** (default) all terms within the same document.

In all cases the best possible matches for your query are located and ordered by decreasing quality. A bar graph is produced to indicate the quality of each answer.

6.4 Interpreting Search Results

**Note:** The look and feel described here is for the standard search interface. The interface may have been customized by the web site administrator.

When a query is submitted it will come back with another query form and up to 10 matching documents. If there are more than 10 answers, a link at the top and bottom of the list will allow you to view the next 10 in sequence.

The input form at the top allows you to further tailor your query to home-in on the desired answers, or to submit a completely new query without having to navigate back to the original input form.

Each answer in the result set will have a format similar to the following:

```
1: THE DOCUMENT TITLE (hyperlink to original)  84%********____
   This is the document abstract. It consists of the text around the first hit within the matching document...
   http://www.thesite.com/thepage.html

   Size: 11K
   Depth: 3
   Find Similar
   Match Info
   Show Parents
```

The components of each result are:

- Result number
- Document title (*Clicking on this will take you to the original document*)
- Abstract (*The first few hundred characters of the document*)
- Match quality graph. 84%********____ (*Only shown if relevance ranking was used*)
- Size (*How big is the original document*)
- Depth (*How many clicks from the top of the site*)
6.4. INTERPRETING SEARCH RESULTS

- Find Similar (*Find other documents similar to this one*)
- Match Info (*View the matches and other information about the document*)
- Show Parents (*List pages that link to this one*)

6.4.1 Viewing Match Info

The Match Info link will show you the context of your answers within the matching document. Matching words will be shown as hyperlinks. Clicking on any match term will take you to the next matching term. A summary at the top of the in-context view shows information about the document, including the time it was last modified.

6.4.2 Finding Similar Documents

The Find Similar link will find documents that are similar to the corresponding result. It does this by reading the original document to ascertain its main subject matter, and then conducting a relevance ranked search for those subjects.

Result documents are ordered from best to worst match. The bar graph display will indicate the overall quality of the match.

**Note:** The document you click on may not be ranked as the best match. This is because other documents may contain more information about the overall subject matter than the original.

6.4.3 Showing Document Parents

Often it is difficult to navigate using a search engine because there is no *back-link* present on the matching document. The Show Parents link solves this.

This link will show other documents that contain hyperlinks to the one you click on. In other words, it is an automated back button.
Appendix A

Third-Party Software

The Search Appliance may contain and utilize the following third-party software to enhance its functionality, depending on the version purchased. Note that your usage and rights to such third-party software may be governed by the appropriate licenses originating with that software, in addition to your License Agreement with Thunderstone - EPI for Thunderstone software.

A.1 Antiword

The antiword package is used by Thunderstone’s anytotx plugin to handle Microsoft(R) Word files. It has been modified to work within anytotx’s installation and to extract meta information. Thunderstone’s modified source may be obtained from ftp://ftp.thunderstone.com/pub/epi-gpl/msfilt.tar.gz or by contacting Thunderstone tech support and requesting a CD containing the modified Antiword source. Sending a CD will require payment of shipping and handling charges by the requestor. antiword is governed by the terms of the GNU GPL, which is reproduced on p. 195.

A.2 Aspell

The GNU Project’s aspell package is executed by (but not linked or compiled into) the Search Appliance for spell-checking and “Did you mean...” queries. Complete source code and documentation is available at ftp://ftp.thunderstone.com/pub/epi-gpl/aspell-0.50.3.tar.gz or ftp://ftp.thunderstone.com/pub/epi-gpl/aspell-0.60.4.tar.gz or by contacting Thunderstone tech support and requesting a CD containing the source. Sending of a CD will require payment of shipping and handling charges by the requestor. aspell is governed by the terms of the GNU Lesser GPL, which is reproduced on p. 212.
A.3 Catdoc xls2csv

Catdoc’s xls2csv program is used by Thunderstone’s anytotx plugin to handle Microsoft(R) Excel(R) spreadsheet files. It has been modified to work within anytotx’s installation and to extract meta information. Thunderstone’s modified source may be obtained from ftp://ftp.thunderstone.com/pub/epi-gpl/msfilt.tar.gz or by contacting Thunderstone tech support and requesting a CD containing the modified Catdoc source. Sending a CD will require payment of shipping and handling charges by the requestor. Catdoc is governed by the terms of the GNU GPL, which is reproduced on p. 195.

A.4 Cole library

The cole library is used by Thunderstone’s versions of catdoc and antiword. It has been modified to prevent extraneous printing. Thunderstone’s modified source may be obtained from ftp://ftp.thunderstone.com/pub/epi-gpl/msfilt.tar.gz or by contacting Thunderstone tech support and requesting a CD containing the modified cole source. Sending a CD will require payment of shipping and handling charges by the requestor. The cole library is governed by the terms of the GNU GPL, which is reproduced on p. 195.

A.5 iconv

GNU libiconv may be used by Thunderstone’s HTML processor to convert documents in certain character sets. GNU libiconv is not incorporated into Thunderstone’s products but is a separate standalone program, called via exec() and writing/reading standard input/output. You may obtain complete source code and documentation for libiconv at ftp://ftp.thunderstone.com/pub/epi-gpl/libiconv-1.9.2.tar.gz or by contacting Thunderstone tech support and requesting a CD containing the GNU libiconv source. Sending a CD will require payment of shipping and handling charges by the requestor. GNU libiconv is governed by the terms of the GNU Library GPL, which is reproduced on p. 212.

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### A.9 JDBC drivers

Walking external databases with the DBWalker module may use one or more of the following drivers.

#### A.9.1 Oracle JDBC driver

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Last updated: 03/09/05

A.9.2 JTDS JDBC driver

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A.9.3 PostgreSQL JDBC driver

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A.9.4 MySQL JDBC driver

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A.10 ppt2html, msg2html

ppt2html and msg2html may be used by Thunderstone’s anytotx document filter to convert Microsoft(R) PowerPoint and .msg files. Source is available at:


or by contacting Thunderstone tech support and requesting a CD containing the source. Sending a CD will require payment of shipping and handling charges by the requestor. ppt2html and msg2html are governed by the terms of the GNU GPL, which is reproduced on p. 195.

A.11 SSL/HTTPS plugin

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`---------------------------------------------
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Jean-loup Gailly Mark Adler
jloup@gzip.org madler@alumni.caltech.edu

The zlib library data format is described by RFCs (Request for Comments) 1950 to 1952 in the files http://www.ietf.org/rfc/rfc1950.txt (zlib format), rfc1951.txt (deflate format) and rfc1952.txt (gzip format).

A.15 SpiderMonkey (JavaScript-C) Engine

The libtxjs.* library (Thunderstone JavaScript plugin) contains and utilizes the SpiderMonkey engine, as well as additional functionality.

The txjs.tar file contains context diffs (patches) to the Mozilla Project’s SpiderMonkey (JavaScript-C) engine, version 1.5-rc4. Complete documentation and source code to the SpiderMonkey Engine is available
The patches in txjs.tar were created by Thunderstone Software LLC and apply to the core SpiderMonkey engine. They are provided for compliance with the Netscape Public License, which governs usage of the SpiderMonkey engine. A copy of the Netscape Public License is on p. 221. Note that the libtxjs.* library also contains other (Thunderstone) code.

A.16 PDF/anytotx plugin

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A.17 thttpd - throttling HTTP server

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3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License.
Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer’s own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user’s computer system, rather than copying library functions into the executable, and (2)
will operate properly with a modified version of the library, if
the user installs one, as long as the modified version is
interface-compatible with the version that the work was made with.

c) Accompany the work with a written offer, valid for at
least three years, to give the same user the materials
specified in Subsection 6a, above, for a charge no more
than the cost of performing this distribution.

d) If distribution of the work is made by offering access to copy
from a designated place, offer equivalent access to copy the above
specified materials from the same place.

e) Verify that the user has already received a copy of these
materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the
Library" must include any data and utility programs needed for
reproducing the executable from it. However, as a special exception,
the materials to be distributed need not include anything that is
normally distributed (in either source or binary form) with the major
components (compiler, kernel, and so on) of the operating system on
which the executable runs, unless that component itself accompanies
the executable.

It may happen that this requirement contradicts the license
restrictions of other proprietary libraries that do not normally
accompany the operating system. Such a contradiction means you cannot
use both them and the Library together in an executable that you
distribute.

7. You may place library facilities that are a work based on the
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facilities not covered by this License, and distribute such a combined
library, provided that the separate distribution of the work based on
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facilities. This must be distributed under the terms of the
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b) Give prominent notice with the combined library of the fact
that part of it is a work based on the Library, and explaining
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<signature of Ty Coon>, 1 April 1990
Ty Coon, President of Vice

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Preamble

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The reason we have a separate public license for some libraries is that they blur the distinction we usually make between modifying or adding to a program and simply using it. Linking a program with a library, without changing the library, is in some sense simply using the library, and is analogous to running a utility program or application program. However, in a textual and legal sense, the linked executable is a combined work, a derivative of the original library, and the ordinary General Public License treats it as such.

Because of this blurred distinction, using the ordinary General Public License for libraries did not effectively promote software sharing, because most developers did not use the libraries. We concluded that weaker conditions might promote sharing better.

However, unrestricted linking of non-free programs would deprive the users of those programs of all benefit from the free status of the libraries themselves. This Library General Public License is intended to permit developers of non-free programs to use free libraries, while preserving your freedom as a user of such programs to change the free libraries that are incorporated in them. (We have not seen how to achieve this as regards changes in header files, but we have achieved it as regards changes in the actual functions of the Library.) The hope is that this will lead to faster development of free libraries.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, while the latter only works together with the library.
Note that it is possible for a library to be covered by the ordinary General Public License rather than by this special one.

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A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".)

"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

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of it, thus forming a work based on the Library, and copy and
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   b) You must cause the files modified to carry prominent notices
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   c) You must cause the whole of the work to be licensed at no
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   d) If a facility in the modified Library refers to a function or a
      table of data to be supplied by an application program that uses
      the facility, other than as an argument passed when the facility
      is invoked, then you must make a good faith effort to ensure that,
      in the event an application does not supply such function or
      table, the facility still operates, and performs whatever part of
      its purpose remains meaningful.

         (For example, a function in a library to compute square roots has
         a purpose that is entirely well-defined independent of the
         application. Therefore, Subsection 2d requires that any
         application-supplied function or table used by this function must
         be optional: if the application does not supply it, the square
         root function must still compute square roots.)

These requirements apply to the modified work as a whole. If
identifiable sections of that work are not derived from the Library,
and can be reasonably considered independent and separate works in
themselves, then this License, and its terms, do not apply to those
sections when you distribute them as separate works. But when you
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this License, whose permissions for other licensees extend to the
entire whole, and thus to each and every part regardless of who wrote
it.

Thus, it is not the intent of this section to claim rights or contest
your rights to work written entirely by you; rather, the intent is to
exercise the right to control the distribution of derivative or
collective works based on the Library.

In addition, mere aggregation of another work not based on the Library
with the Library (or with a work based on the Library) on a volume of
a storage or distribution medium does not bring the other work under
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Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may
distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also compile or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

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a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

b) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

c) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

d) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.
It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

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