

The Foxhound 4 Database Monitor

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2016 11 15

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Introduction

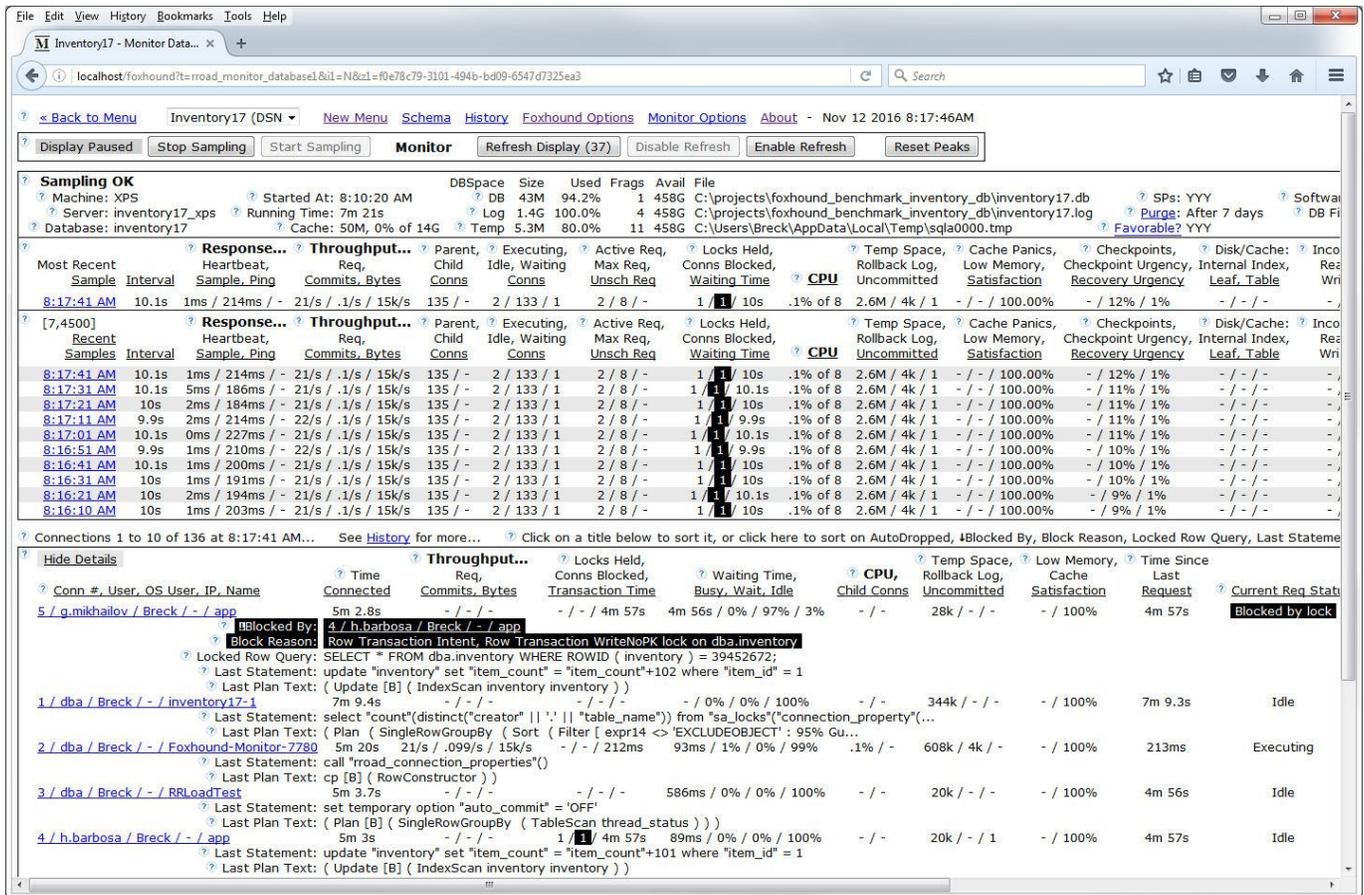
A database monitor is a computer program that measures the activity of a database management system and displays those measurements in a meaningful way so you can see everything's OK... or quickly learn about problems and threats to performance and availability.

Foxhound 4 is a third-party database monitor for SAP® SQL Anywhere®. Here's how it works:

- Every 10 seconds Foxhound retrieves performance statistics from your database.
- Foxhound then
 - stores these statistics in its own SQL Anywhere 16 database,
 - performs summarization and other value-added calculations, and
 - displays the results via HTML using SQL Anywhere's built-in HTTP server.

Figure 1 shows the [Foxhound Monitor page](#) for a lightly-loaded SQL Anywhere server with 135 connections, one of which is blocked by an uncommitted operation made by a long-running transaction on another connection.

Figure 1. The Foxhound Monitor Page Showing An Idle Server With One Blocked Connection



New in Foxhound 4: **White-on-black** and **grey** highlighting is now used instead of colors.

Foxhound Versus The Alternatives

Table 1 compares Foxhound Version 4 with several alternative products:

- the [SQL Anywhere Monitor](#) that is available with certain SQL Anywhere 17 editions,
- the [Sybase Central Performance Monitor](#) that comes with SQL Anywhere 16,
- the [SQL Anywhere Cockpit](#) that comes with SQL Anywhere 17,
- the [DBConsole utility](#) that also comes with SQL Anywhere 16 and
- the [Windows Performance Monitor \(PERFMON\)](#) that is supported by SQL Anywhere 17.

Table 1. Comparing Foxhound 4 With Alternative Products						
Product: ⁵	SQL Anywhere Monitor 17	Sybase Central Performance Monitor 16 ¹	SQL Anywhere Cockpit 17	DBConsole Utility 16 ²	Windows Performance Monitor	Foxhound 4
Primary Purpose	Health and availability monitor	Performance monitor	Health, availability and performance monitor	Connection monitor	Performance monitor	Health, availability and performance monitor
Setup Required	A lot	Everything	Some	Some	Everything	Very little
Collection Interval	30 sec default, 10 sec minimum	1 sec fixed	Frequent	4 sec default, 1 sec minimum	1 sec default, 1 sec minimum	10 sec fixed
Presentation	Graphs, Text	Graphs	Graphs, Text	Text	Graphs	Text
Implementation	Adobe Flash	Java	HTML5	Native Windows	Native Windows	HTML
Historical Data	Limited	No	No	No	No	Yes
Connection History	No	No	No	No	No	Yes
Adhoc Reporting	No	No	No	No	No	Yes
SQL Anywhere Statistics	Some, Variable	All, Variable	All, Fixed	All, Variable	All, Variable	Some, Fixed
Peak Highlighting	No	No	No	No	No	Yes
Value-Added Calculations	No	No	No	No	No	Yes
Alerts	9 point-in-time events	No	Some point-in-time events	No	No	34 conditions
Alert "All Clear"	No	No	No	No	No	Yes
Alert Emails	Yes	No	No	No	No	Yes
Ping New Connections	No	No	No	No	No	Yes
Drop Connection	Manual	No	Manual	Manual	No	AutoDrop
Docs	Minimal	Minimal	Minimal	Minimal	Minimal	Extensive
Target Databases Supported	11, 12, 16, 17	11, 12, 16	17 ³	11, 12, 16	5.5, 6, 7, 8, 9, 10, 11, 12, 16, 17	6, 7, 8, 9, 10, 11, 12, 16, 17 ⁴
Target Hosts Supported	Local, Network	Local, Network	Local, Network	Local, Network	Local	Local, Network
MobiLink and Relay Server Support	Yes	No	No	No	No	No
What's Good?	Pretty	Free	Pretty	Free	Free	Businesslike
What Else?	Modal	Hideous	Modal	Basic	Hideous	Dense

Primary Purpose: This is how the products are advertised.

Setup Required: Both DBConsole and Foxhound let you "connect and go" to see something useful while the others require varying degrees of effort to get started.

Collection Interval: 10 seconds is tradeoff between accuracy and efficiency.

Presentation: Nobody's asking for graphs so they remain a low-priority item for Foxhound.

Implementation: How the presentation is implemented explains a lot about how a product looks and feels.

Historical Data: Only Foxhound provides random access to every measurement stored in the database.

Connection History: Only Foxhound lets you view the entire history of a single connection.

Adhoc Reporting: Only Foxhound recognizes that all your data belongs to you and should be accessible.

SQL Anywhere Statistics: Like the collection interval, Foxhound's choice of which statistics to gather is fixed.

Peak Highlighting: This is what Foxhound does instead of graphs.

Value-Added Calculations: Latency, Throughput, CPU % and many other values are derived from raw statistics.

Alerts: Events happen once, conditions go into and out of effect.

Alert "All Clear": It's important to know when an Alert condition is no longer in effect.

Alert Emails: The SQL Anywhere Monitor sends emails for Alerts, Foxhound also sends All Clear emails.

Ping New Connections: Only Foxhound checks that the target database is accepting new connections.

Drop Connection: Only Foxhound can automatically drop runaway connections.

Docs: The Foxhound Help includes dozens of performance tips.

Target Databases Supported: Foxhound support for Version 5.5 databases is fading but not gone.

Target Hosts Supported: The Windows Performance Monitor reports on the computer it's running on.

MobiLink and Relay Server Support: The SQL Anywhere Monitor is the only game in town for this.

What's Good? "If you had to use a single word to describe what you like about this product, what would it be?"

What Else? "Give me another word, this time describing what you don't like about this product."

Footnotes for Table 1:

1. The Sybase Central Performance Monitor is not available in SQL Anywhere 17.
2. The Dbconsole Utility is not available in SQL Anywhere 17.
3. The SQL Anywhere Cockpit does support SQL Anywhere 16 databases running on SQL Anywhere 17.
4. Foxhound 4 does support SQL Anywhere 5.5 databases running on SQL Anywhere 6 and later versions.
5. The new SQL Anywhere Profiler 17 is omitted because it's a completely different kind of product; it's complementary but not comparable.

Hallmarks of Foxhound

Here's a list of Foxhound characteristics you can take advantage of:

- Functionality out of the box** Foxhound just requires a connection string or DSN to get started; the next thing you see is your database in the Foxhound Monitor page; there are no widgets or wizards to deal with, and no need to pick and choose which statistics to display.
- Guidance** Foxhound provides on-screen guidance for all the data it displays and all the options it offers. The column titles, tooltip text, field descriptions, context-sensitive Help and performance tips are all designed to help you understand what you are looking at and what you can do about it.
- Information at a glance** Foxhound presents a straightforward interface for professional developers with no graphs, waveforms or "data visualization" artwork. All the relevant data and value-added calculations are gathered together on single pages with peak highlighting and hypertext links to scroll through history and open different views in new browser tabs.
- Open access** Foxhound provides read-only SQL access to all the historical data pertaining to your database: it's your data, you own it. The Foxhound Help contains sample queries, and to make your own queries easier to write important internal primary key values are displayed together with the data on the Monitor and other pages; e.g., `sampling_id`, `sample_set_number` and the new `connection_id_string`.
- Legacy support** Foxhound supports target databases running all versions of SQL Anywhere from 6 to 17. And while it's true that older versions of SQL Anywhere don't provide (and Foxhound doesn't display) modern performance statistics, statistics that are available do get displayed, not lowest common denominators.

Figure 2 shows the value-added Throughput numbers at both the database and connection level, together with the corresponding database-level Help topics.

Figure 2. Foxhound Hallmarks: Information At A Glance With Side-By-Side Guidance

The screenshot displays the Foxhound Sample History page. The main table shows performance metrics for various samples, including time intervals, heartbeat, and throughput. The side-by-side help panel provides detailed information about the 'Throughput... Req, Commits, Bytes' metric, including a performance tip and a note about the 'request' unit.

Time	Heartbeat, Sample, Ping	Req, Commits, Bytes
8:56:37 AM	9.6s 0ms / 253ms / -	34,994/s / 18,738/s / 4.2M/s
8:56:28 AM	10s 40ms / 691ms / -	46,924/s / 23,566/s / 5.5M/s
8:56:18 AM	10.3s 7ms / 761ms / -	41,633/s / 20,063/s / 4.9M/s
8:56:08 AM	9.8s 5ms / 449ms / -	47,040/s / 23,562/s / 5.6M/s
8:55:58 AM	9.7s 5ms / 551ms / -	44,797/s / 22,845/s / 5.3M/s
8:55:48 AM	10.1s 7ms / 774ms / -	45,083/s / 21,911/s / 5.3M/s
8:55:38 AM	10.1s 6ms / 811ms / -	44,749/s / 22,182/s / 5.3M/s
8:55:28 AM	6.4s 12ms / 619ms / -	43,162/s / 22,074/s / 5.1M/s
8:55:22 AM	9.5s 6ms / 897ms / -	- / - / -

Throughput... Req, Commits, Bytes

Throughput, also known as bandwidth, is a measure of how much work the database has performed:

Throughput... Req is the rate at which the server has started processing a new request or resumed processing an existing request during the preceding interval.

Performance Tip: Large Throughput... Req values may indicate that heavy client load on the database is a performance bottleneck. Small values may indicate that some other performance bottleneck is preventing the database from processing client requests.

Note that "request" is an atomic internal unit of work processed by the server for a connection, not a client-server communication request from a client application to the SQL Anywhere server.

The latter is not displayed by Foxhound; however, it is recorded by Foxhound in the `sample_connection.RequestsReceived` column for adhoc queries of connection-level data.

Throughput... Req is based on the server-level Req property

(note that this is different from the connection-level Throughput... Req column which is based on the connection-level ReqCountActive property)

Throughput... Commits is the approximate rate at which commit requests have been executed by all connections in the previous interval.

Performance Tip: Large Throughput... Commits values may indicate that heavy client load on the database is a performance bottleneck. Small values may indicate that some other performance bottleneck is preventing the database from processing client requests.

Feature: The Foxhound Menu Page

The [Menu page](#) is Foxhound's home page. The DSN tab in Figure 3 lets you pick a target database from a drop-down list of ODBC DSNs and then click on the Monitor Database button.

Alternatively, the String tab in Figure 4 lets you create a DSN-less connection to a target database.

Figure 3. The DSN Tab on the Foxhound Menu Page

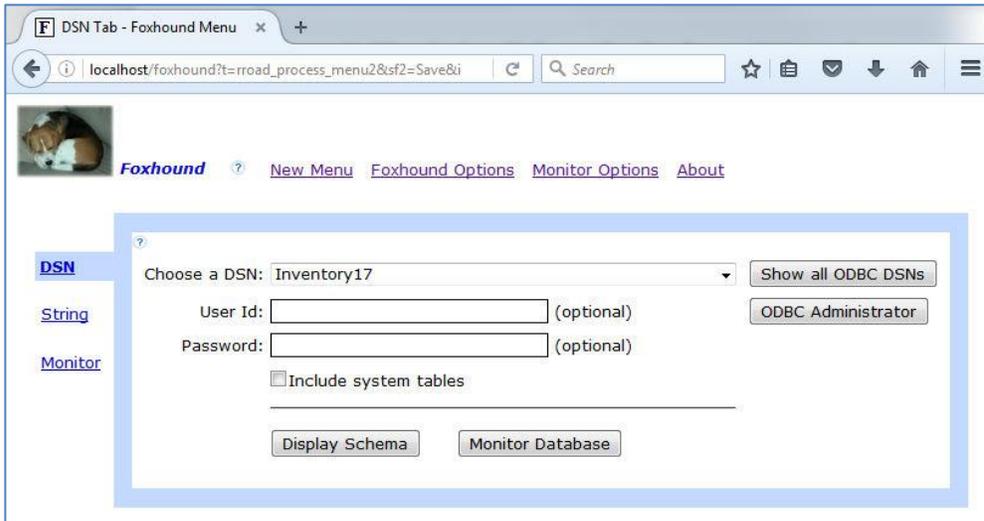
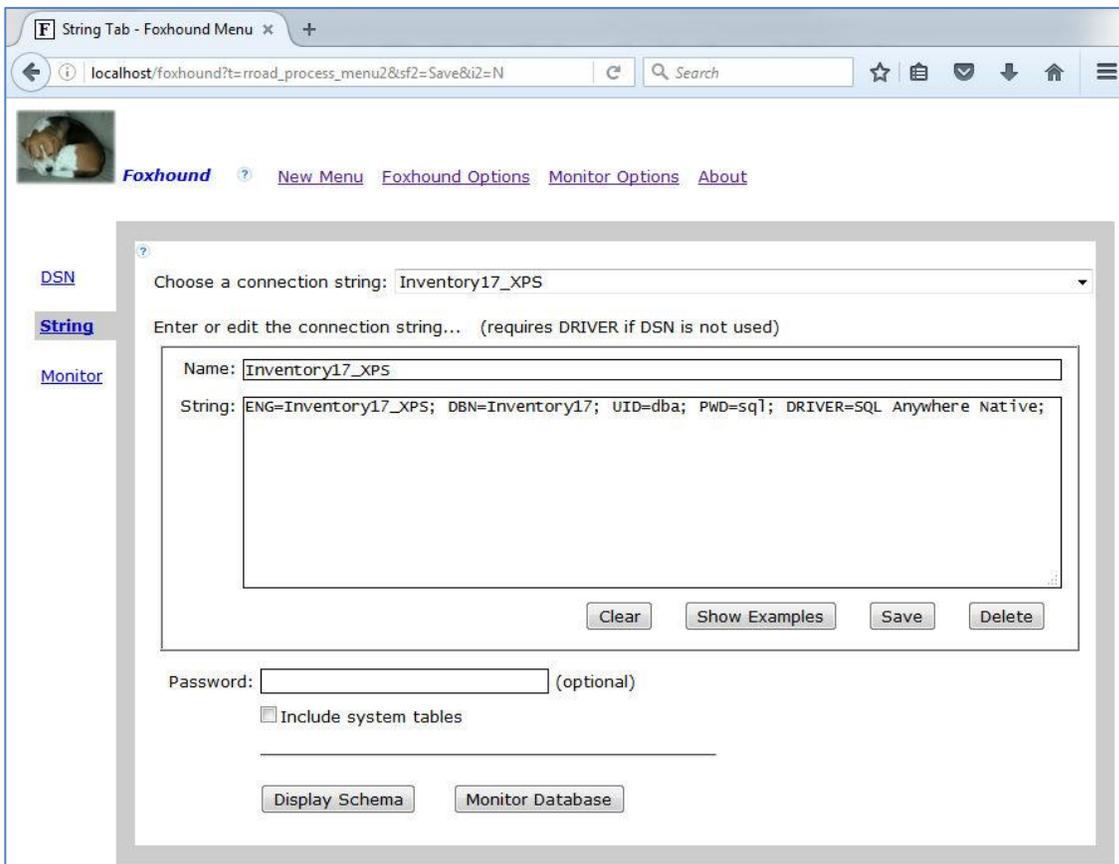


Figure 4. The String Tab

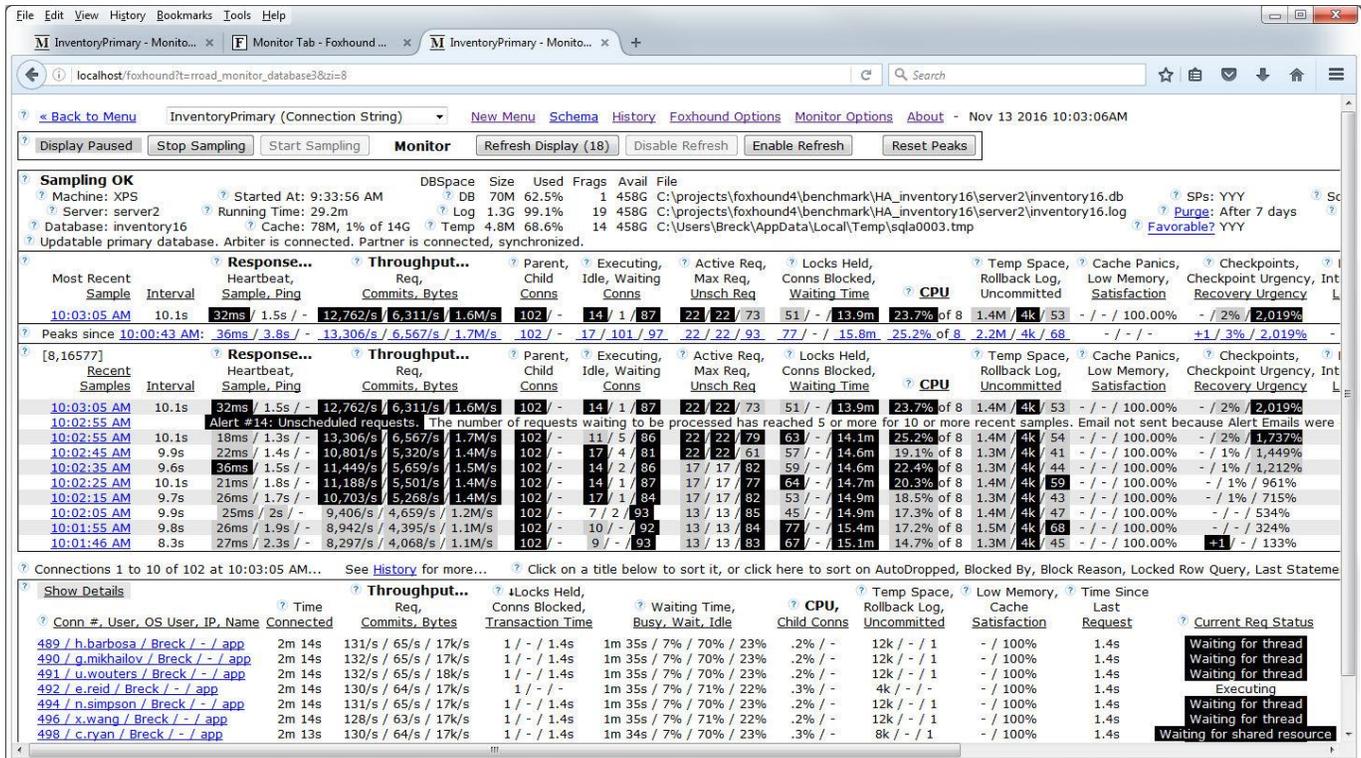


Feature: The Monitor Page

The [Monitor page](#) is automatically refreshed every 10 seconds to show a snapshot of current activity: the most recent 10 samples plus the most recent details of 10 connections.

Figure 5 shows a busy primary database in a SQL Anywhere 16 High Availability setup. One Alert has been issued: [Alert #14 Unscheduled requests](#) indicates there's a bottleneck in satisfying client requests. The [Max Req column](#) shows that SQL Anywhere's "AutoMultiProgrammingLevel" has been adjusting the maximum number of tasks that can be active (Max Req is currently 22) but there's a serious backlog (Unsch Req 73).

Figure 5. The Monitor Page For A Busy Database



The Monitor page is filled with hypertext links, most of them opening new tabs showing historical data:

- The [Recent Samples links](#) like 10:03:05 AM open the Sample History page positioned on the selected sample, and
- the [connection links](#) like 489 / h.barbosa / Breck / - / app open the Connection History page for the selected connection.

Sample History and Connection History pages are described in the next two sections.

Tip: The 10-second refresh cycle of the Monitor page is not related to the 10-second Foxhound sampling interval. The underlying Foxhound sampling process continues until instructed to stop, whether or not the Monitor page is displayed at all.

Feature: The Sample History Page

Figure 6 shows the same server as Figure 5, this time using the [Sample History page](#) which

- doesn't get refreshed automatically, but
- does show more data (100 samples and 100 connections at a time),
- does let you jump and scroll through the samples and the connections recorded for one sample, and
- does provide layout control with frames and hide/show buttons.

Figure 6. The Sample History Page For The Same Busy Database

The screenshot shows a web browser window displaying the 'Sample History' page for a database. The page title is 'InventoryPrimary - History...'. The browser address bar shows 'localhost/foxbound?t=road_history_frameset&sn=16577&zi=8&sf=Pick'. The page content includes a navigation bar with 'Back to Menu', 'InventoryPrimary (Connection String)', and various menu options. Below this is a 'Sample History' section with a table of performance metrics. The table has columns for 'Top Sample', 'Interval', 'Response...', 'Throughput...', 'Parent, Child Conns', 'Executing, Idle, Waiting Conns', 'Active Req, Max Req, Unsch Req', 'Locks Held, Conns Blocked, Waiting Time', 'CPU', 'Temp Space, Rollback Log, Uncommitted', 'Cache Panics, Low Memory, Satisfaction', and 'Checkpoints, Checkpoint Urgency, Recovery Urgency'. A 'Peaks since' section highlights a period of high activity at 10:00:43 AM. Below the main table, there is a 'Connections' section with a 'Show Details' link for a specific connection.

Top Sample	Interval	Response...	Throughput...	Parent, Child Conns	Executing, Idle, Waiting Conns	Active Req, Max Req, Unsch Req	Locks Held, Conns Blocked, Waiting Time	CPU	Temp Space, Rollback Log, Uncommitted	Cache Panics, Low Memory, Satisfaction	Checkpoints, Checkpoint Urgency, Recovery Urgency
10:03:05 AM (19.6m)	10.1s	32ms / 1.5s / -	12,762/s / 6,311/s / 1.6M/s	102 / -	14 / 1 / 87	22 / 22 / 73	51 / - / 13.9m	23.7% of 8	1.4M / 4k / 53	- / - / 100.00%	- / 2% / 2,019%
Peaks since 10:00:43 AM: 198ms / 5.2s / - 15,838/s / 7,857/s / 2M/s 102 / - 24 / 101 / 97 29 / 29 / 93 77 / - / 15.8m 26.3% of 8 2.2M / 4k / 68 - / - / - +1 / 25% / 3,446%											
Alert #14: Unscheduled requests. The number of requests waiting to be processed has reached 5 or more for 10 or more recent samples. Email not sent because Alert Emails were											
10:02:05 AM	10.1s	18ms / 1.3s / -	13,306/s / 6,567/s / 1.7M/s	102 / -	11 / 5 / 86	22 / 22 / 79	63 / - / 14.1m	25.2% of 8	1.4M / 4k / 54	- / - / 100.00%	- / 2% / 1,737%
10:02:45 AM	9.9s	22ms / 1.4s / -	10,801/s / 5,320/s / 1.4M/s	102 / -	17 / 4 / 81	22 / 22 / 61	57 / - / 14.6m	19.1% of 8	1.3M / 4k / 41	- / - / 100.00%	- / 1% / 1,449%
10:02:35 AM	9.6s	36ms / 1.5s / -	11,449/s / 5,659/s / 1.5M/s	102 / -	14 / 2 / 86	17 / 17 / 82	59 / - / 14.6m	22.4% of 8	1.3M / 4k / 44	- / - / 100.00%	- / 1% / 1,212%
10:02:25 AM	10.1s	21ms / 1.8s / -	11,188/s / 5,501/s / 1.4M/s	102 / -	14 / 1 / 87	17 / 17 / 77	64 / - / 14.7m	20.3% of 8	1.4M / 4k / 59	- / - / 100.00%	- / 1% / 961%
10:02:15 AM	9.7s	26ms / 1.7s / -	10,703/s / 5,268/s / 1.4M/s	102 / -	17 / 1 / 84	17 / 17 / 82	53 / - / 14.9m	18.5% of 8	1.3M / 4k / 43	- / - / 100.00%	- / 1% / 715%
10:02:05 AM	9.9s	25ms / 2s / -	9,406/s / 4,659/s / 1.2M/s	102 / -	7 / 2 / 93	13 / 13 / 85	45 / - / 14.9m	17.3% of 8	1.4M / 4k / 47	- / - / 100.00%	- / - / 534%
10:01:55 AM	9.8s	26ms / 1.9s / -	8,942/s / 4,395/s / 1.1M/s	102 / -	10 / - / 92	13 / 13 / 84	77 / - / 15.4m	17.2% of 8	1.5M / 4k / 68	- / - / 100.00%	- / - / 324%
10:01:46 AM	8.3s	27ms / 2.3s / -	8,297/s / 4,068/s / 1.1M/s	102 / -	9 / - / 93	13 / 13 / 83	67 / - / 15.1m	14.7% of 8	1.3M / 4k / 45	- / - / 100.00%	+1 / - / 133%

Connections 1 to 100 of 102 at 10:03:05 AM... Next > Click on a title below to sort it, or click here to sort on AutoDropped, Blocked By, Block Reason, Locked Row Query, Last Statement or Last Plan Text.

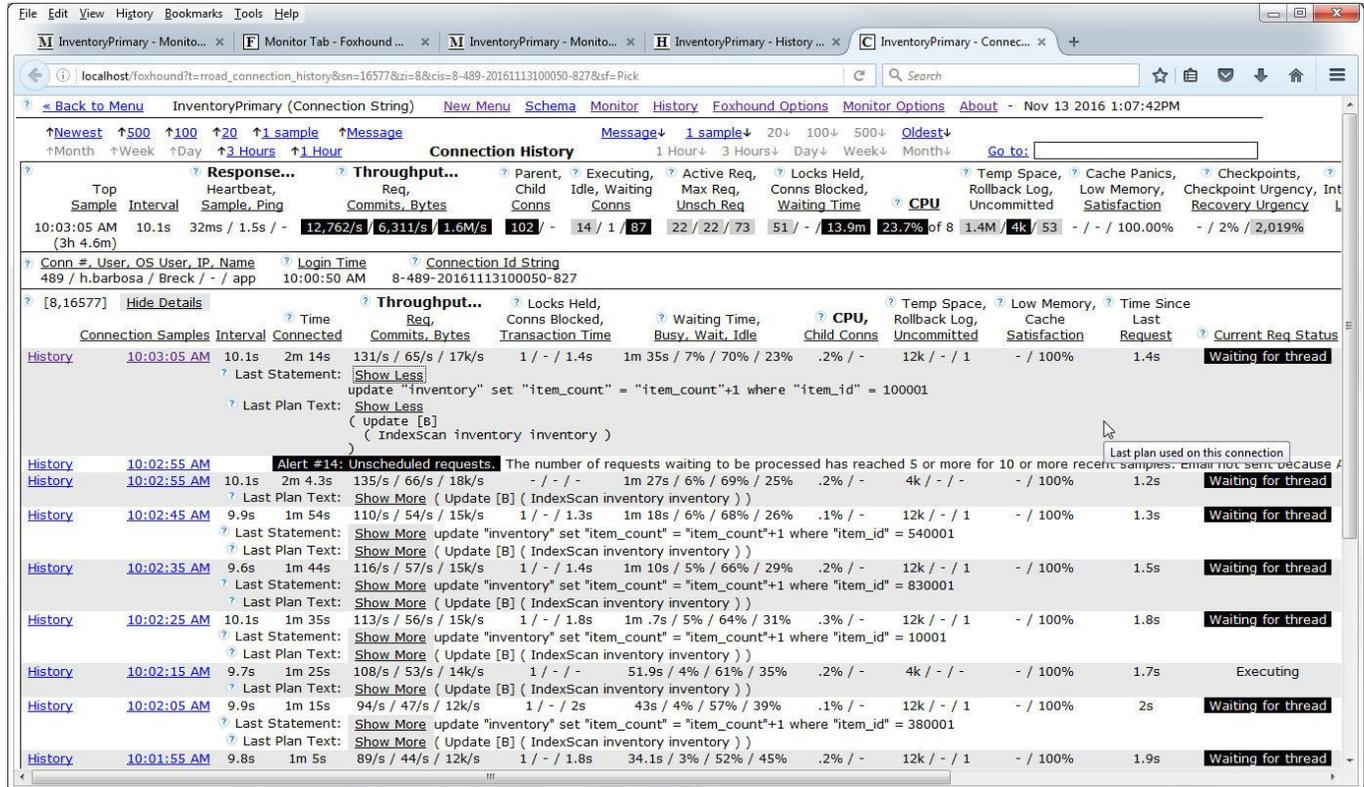
Conn #, User, OS User, IP, Name	Time Connected	Throughput...	Locks Held, Conns Blocked, Transaction Time	Waiting Time, Busy, Wait, Idle	CPU, Child Conns	Temp Space, Rollback Log, Uncommitted	Low Memory, Cache Satisfaction	Time Since Last Request	Current Req
489 / h.barbosa / Breck / - / app	2m 14s	131/s / 65/s / 17k/s	1 / - / 1.4s	1m 35s / 7% / 70% / 23%	.2% / -	12k / - / 1	- / 100%	1.4s	Waiting for th
490 / g.mikhailov / Breck / - / app	2m 14s	132/s / 65/s / 17k/s	1 / - / 1.4s	1m 35s / 7% / 70% / 23%	.2% / -	12k / - / 1	- / 100%	1.4s	Waiting for th
491 / u.wouters / Breck / - / app	2m 14s	132/s / 65/s / 18k/s	1 / - / 1.4s	1m 35s / 7% / 70% / 23%	.2% / -	12k / - / 1	- / 100%	1.4s	Waiting for th
492 / e.reid / Breck / - / app	2m 14s	130/s / 64/s / 17k/s	1 / - / -	1m 35s / 7% / 71% / 22%	.3% / -	4k / - / -	- / 100%	1.4s	Executing

The [connection links](#) like 489 / h.barbosa / Breck / - / app open a Connection History page for the selected connection in a new tab. This "drill down" view is shown in the next section.

Feature: The Connection History Page

Figure 7 shows yet another view of the busy server in Figures 5 and 6. The [Connection History page](#) shows the history of performance statistics for one single connection over time. A snapshot of the most recent server and database statistics is included at the top of the page, but the rest of the page is devoted to that one connection.

Figure 7. The Connection History Page



Alert messages are displayed Connection History even when they have nothing to do with connection being displayed because it's always important to know what's going on.

Each [History](#) link opens a Sample History page in a new tab, positioned to the same sample, in effect returning to the "big picture" view shown in the previous section.

Tip: The [Connection Id String](#) uniquely identifies a connection by connection number and login time so the Connection History page doesn't mix up different connections with the same connection number. It is also useful for adhoc queries; that's the only reason it's displayed on the Connection History page, so you can copy and paste the value into your ISQL session.

Feature: Alerts

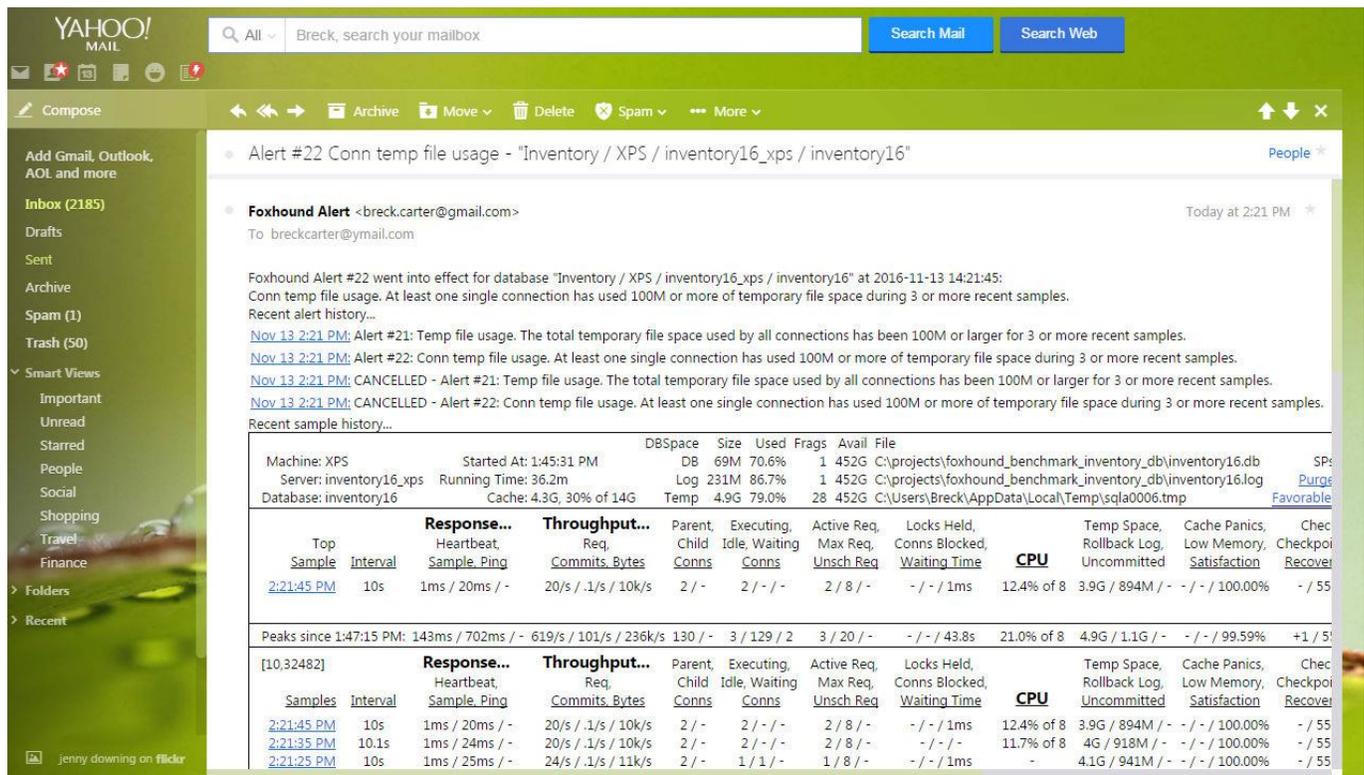
Figure 8 shows an [Alert email](#) for a connection that has violated a strict limit placed on the amount of temporary space a single connection can use; in this case, 100M for 3 or more samples (about 30 seconds).

The email subject line is a highly condensed summary:

- What happened? [Alert #22 Conn temp file usage](#)
- Where did it happen? Inventory
- Where exactly was that? Machine XPS, Server inventory16_xps, Database inventory16

As well as describing this Alert, the body of the email contains a list of recent alerts for this database and a snapshot of the Monitor page when this Alert was issued.

Figure 8. An Alert Email



Tip: If Google Gmail doesn't display Alert messages properly, try another client like Yahoo Ymail. You can still use Google's SMTP server to send Foxhound Alert messages, however; it works just fine.

Table 2 shows the default definitions for [all the Alert conditions supported in Foxhound 4](#). The values shown in [square braces] can be changed for each target databases, except for [server2] which is determined at runtime.

Table 2. Default Alert Criteria	
1 Database unresponsive	Foxhound has been unable to gather samples for [1m] or longer.
2 Long heartbeat	The heartbeat time has been [1s] or longer for [10] or more recent samples.
3 Long sample time	The sample time has been [10s] or longer for [10] or more recent samples.
4 CPU usage	The CPU time has been [90]% or higher for [10] or more recent samples.
5 Database disk space	The free disk space on the drive holding the main database file has fallen below [1G].
6 Temp disk space	The free disk space on the drive holding the temporary file has fallen below [1G].
7 Log disk space	The free disk space on the drive holding the transaction log file has fallen below [1G].
8 Other disk space	The free disk space on one or more drives holding other database files has fallen below [1G].
9 Arbiter unreachable	The high availability target database has become disconnected from the arbiter server.
10 Partner unreachable	The high availability target database has become disconnected from the partner database.
11 ServerName change	The real server name has changed to [server2], possibly because of an HA failover or OnDemand move.
13 File fragmentation	There are [1,000] or more fragments in the main database file.
14 Unscheduled requests	The number of requests waiting to be processed has reached [5] or more for [10] or more recent samples.
15 Incomplete I/Os	The current number of incomplete file reads and/or writes has reached [2] or more for [10] or more recent samples.
16 I/O operations	There have been [1,000] or more disk and log I/O operations per second for [10] or more recent samples.
17 Checkpoint urgency	The Checkpoint Urgency has been [100]% or more for [10] or more recent samples.
18 Recovery urgency	The Recovery Urgency has been [1,000]% or more for [10] or more recent samples.
19 Cache size	The cache has reached [100]% of its maximum size for [10] or more recent samples.
20 Cache satisfaction	The cache satisfaction (hits/reads) has fallen to [90]% or lower for [10] or more recent samples.
21 Temp file usage	The total temporary file space used by all connections has been [1G] or larger for [10] or more recent samples.
22 Conn temp file usage	At least one single connection has used [512M] or more of temporary file space during [10] or more recent samples.

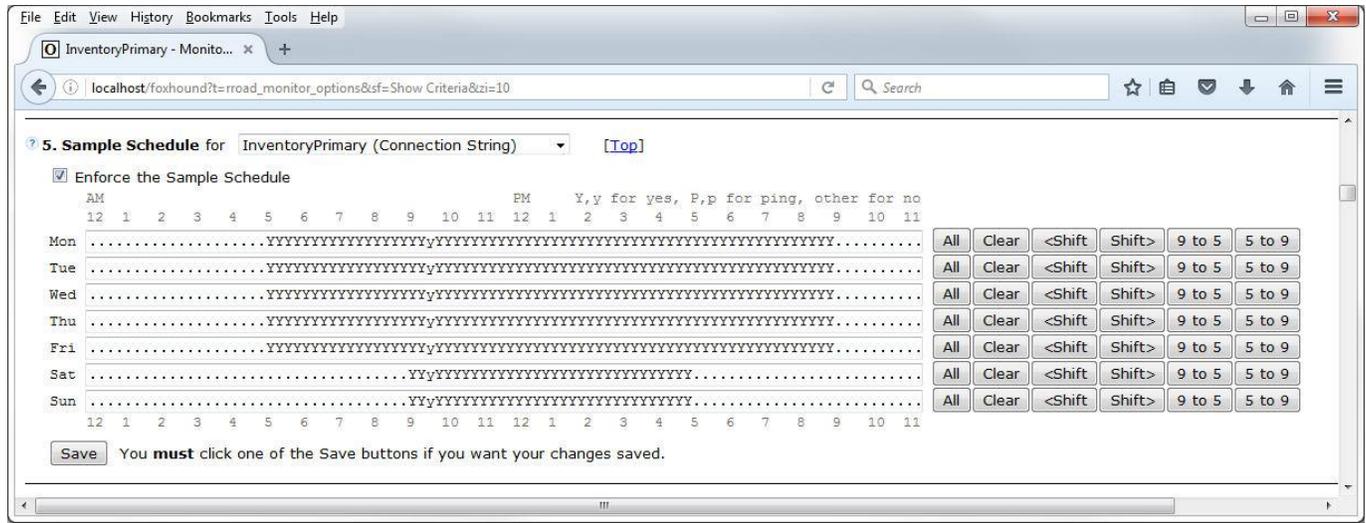
Table 2. Default Alert Criteria (continued)	
23 Blocked connections	The number of blocked connections has reached [10] or more during [10] or more recent samples.
24 Conn blocking others	At least one single connection has blocked [5] or more other connections during [10] or more recent samples.
25 Locks	The number of locks has reached [1,000,000] or more during [10] or more recent samples.
26 Connections	The number of connections has reached [1,000] or more for [10] or more recent samples.
27 Connection CPU	The approximate CPU time has been [25]% or higher for at least one connection during [10] or more recent samples.
28 Long transaction	The transaction running time has reached [1m] or more for at least one connection during [10] or more recent samples.
29 Cache panics	There have been [1] or more cache panics per second for [10] or more recent samples.
30 Database read-only	The target database has changed from accepting updates to read-only processing.
31 Database updatable	The target database has changed from read-only processing to accepting updates.
32 Rollback log usage	The total rollback log space used by all connections has been [1G] or larger for [10] or more recent samples.
33 Uncommitted operations	The total number of uncommitted operations for all connections has reached [1,000,000] or more during [10] or more recent samples.
34 Long uncommitted	The number of uncommitted operations has reached [1,000,000] or more while the transaction running time has reached [1m] or more for at least one connection.
35 Separate ping failed	Foxhound has been unable to make a separate ping connection to the target database for [10] or more recent samples.

Feature: Schedules

For every target database being monitored by Foxhound, four separate schedules may be created to turn specific features on and off in 15-minute intervals over a 7-day week:

- start and stop [the entire monitor process](#) (as shown in Figure 9 below),
- start and stop [the gathering of connection-level statistics](#) for each sample,
- start and stop [the sending of Alert emails](#), and
- start and stop [the AutoDrop process](#) that deals with runaway connections.

Figure 9. Sample Schedule



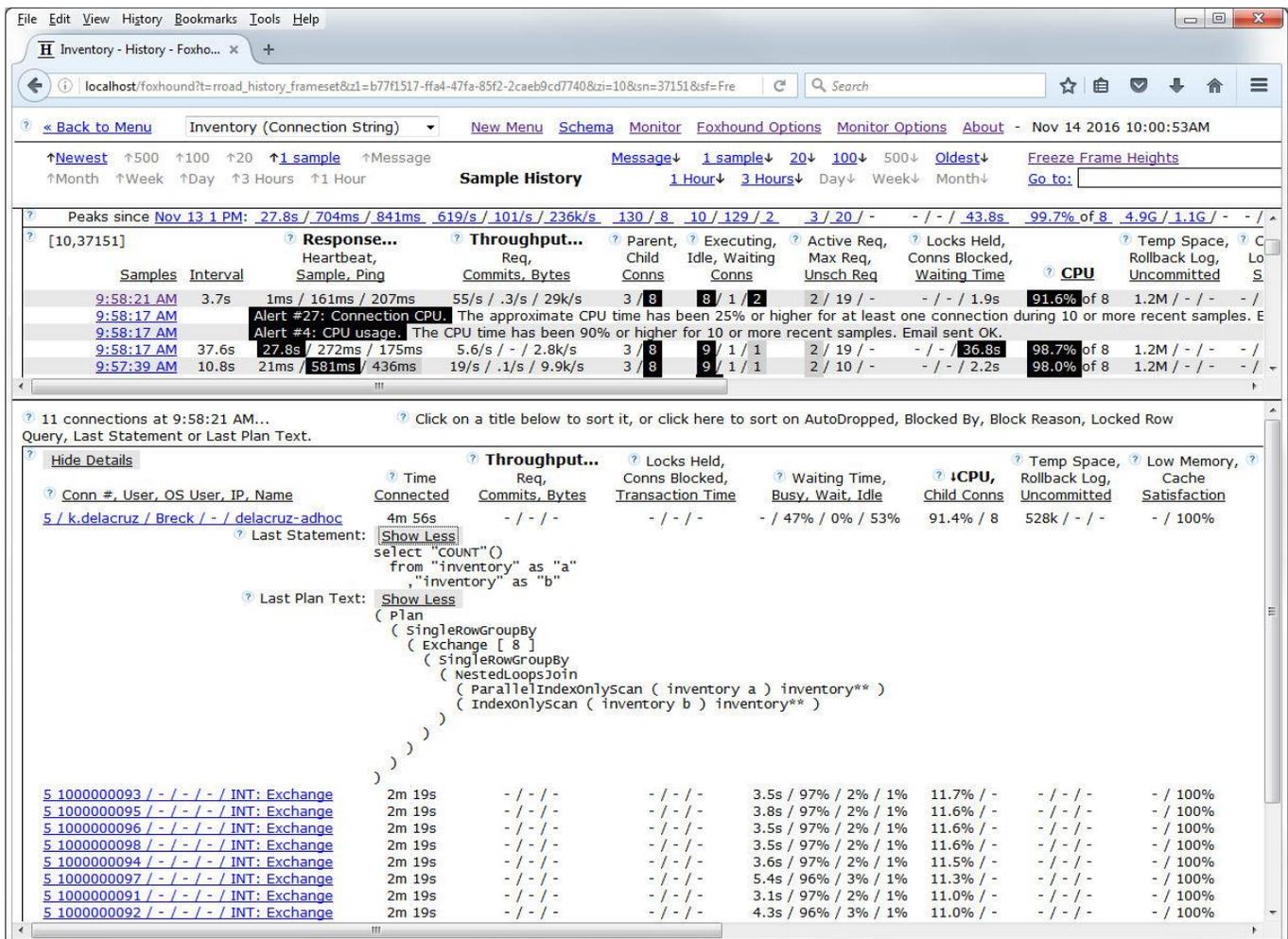
New in Foxhound 4: Drop-down list boxes let you switch among different target databases on the Monitor Options page (shown above) as well as on the Monitor and Sample History pages.

Usage 1: Runaway CPU Usage

Figure 10 shows a single database connection that is using up all the CPU time (92% of 8 processors). The [Parent, Child Conns column](#) shows there are 3 external database connections and 8 internal child connections, and the connections frame at the bottom of the page shows that connection 5 is the external connection responsible for creating all 8 internal connections named "INT: EXCHANGE". The [Last Plan Text field](#) shows why: SQL Anywhere's intra-query parallelism feature is in full force with all 8 processors devoted to performing a "Parallel Index-Only Scan".

In this case, the details of the "why" may not be as important as the "what": Connection 5 is a runaway. A quick solution might be to drop connection 5, and Foxhound's AutoDrop feature can be used to automate that solution. Another solution might be to "turn down the volume" on the intra-query parallelism feature by setting the MAX_QUERY_TASKS database option to something other than "all processors"; e.g., 4, or even 1 to turn it off altogether. Other solutions might be to change the query to be less aggressive, or schedule it in off-peak hours.

Figure 10. Runaway Connection



Tip: The CPU percentages are a prime example of Foxhound's value-added calculations where Foxhound displays child connections together with their parents and adjusts the CPU percentages so they make sense.

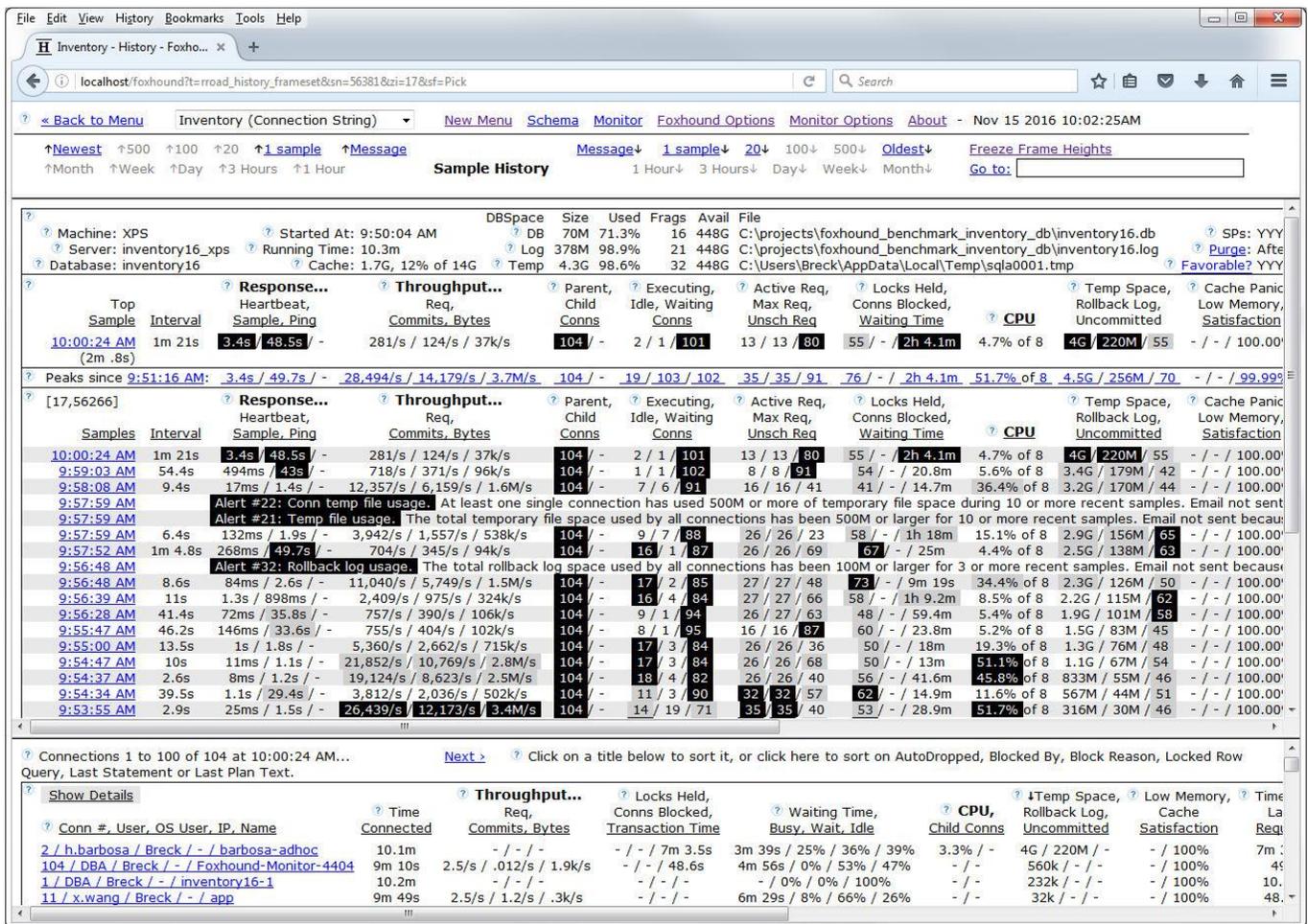
Usage 2: Runaway Memory Usage

Figure 11 shows a SQL Anywhere 16 server that is behaving erratically in the face of a steady load:

- The Interval column diverges from the expected 10-seconds-per-sample rate,
- the Response and Throughput columns fluctuate wildly, and
- CPU usage varies up and down between 5% and 50% even though the workload remains constant.

The [Alert #22 reveals the culprit](#): A single connection that is consuming Temp Space at a great rate, causing great difficulties for the other 100 connections that are trying to get something done. The other values (CPU usage, response time, etc) aren't the problem, they're symptoms of runaway Temp Space usage.

Figure 11. Runaway Memory Usage



Tip: The Connections section at the bottom of Figure 11 shows what happens when you click on the "Temp Space" column title to bring "2 / h.barbosa / Breck / - / barbosa-adhoc" to the top. You can do this with any of the Connections columns on the Monitor and Sample History pages.

Usage 3: Large Deployments

SQL Anywhere makes it easy to deploy large numbers of separate database servers on the same and different computers, each one running multiple databases. Foxhound deals with large deployments in a number of ways:

- The [Manage Multiple Monitor Sessions facility](#) lets you define a connection strings file to make it easier to start and stop Foxhound monitor session for large numbers of target databases.
- The [Save and Restore Monitor Options facility](#) lets you manipulate the Monitor Options settings for each target database, plus a separate set of "Default Settings", in ways that make it easier to deal with large deployments. In particular, you can edit the Default Settings separately from actual target databases, then use the Force Default Settings on All Targets button to publish the same set of Monitor Options to all the actual Foxhound monitor sessions.
- The [Monitor tab on the Foxhound Menu page](#) (shown in Figure 12) shows all the Foxhound monitor sessions at a glance.

Figure 12. The Monitor Tab on the Foxhound Menu Page

The screenshot shows the Foxhound web interface. At the top, there are navigation links: [New Menu](#), [Foxhound Options](#), [Monitor Options](#), and [About](#). Below these are several buttons: [Start All Sampling](#), [Stop All Sampling](#), [Refresh Display \(93\)](#), [Disable Refresh](#), and [Enable Refresh](#). The main content is a table with the following columns: ID, Target Database, Open Page, Monitor, Monitor Status, Active Alerts, Heartbeat, Unsch Req, Conns, Blocked, and CPU Time. The table lists 30 monitor sessions (ddd001 to ddd030). Most are in a 'Sampling OK' state. Session ddd018 is highlighted in red and has an alert: '#1: Specified database not found'. Below the table, there is an alert box for ddd018: 'Alert #1: Database unresponsive. Foxhound has been unable to gather samples for 10s or longer. Email not sent because Alert Emails were disabled.'

ID	Target Database	Open Page	Monitor	Monitor Status	Active Alerts	Heartbeat	Unsch Req	Conns, Blocked	CPU Time
120	ddd001	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	2 / 0	.9%	
121	ddd002	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	1.0%	
122	ddd003	Monitor History Options	Start Stop Delete	Sampling OK	-	13ms / 0	1 / 0	.9%	
123	ddd004	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	.9%	
124	ddd005	Monitor History Options	Start Stop Delete	Sampling OK	-	2ms / 0	1 / 0	1.0%	
125	ddd006	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	.9%	
126	ddd007	Monitor History Options	Start Stop Delete	Sampling OK	-	2ms / 0	1 / 0	.9%	
127	ddd008	Monitor History Options	Start Stop Delete	Sampling OK	-	2ms / 0	1 / 0	1.0%	
128	ddd009	Monitor History Options	Start Stop Delete	Sampling OK	-	0ms / 0	1 / 0	.9%	
129	ddd010	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	.9%	
130	ddd011	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	.9%	
131	ddd012	Monitor History Options	Start Stop Delete	Sampling OK	-	0ms / 0	1 / 0	.9%	
132	ddd013	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	.9%	
133	ddd014	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	1.0%	
134	ddd015	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	.9%	
135	ddd016	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	.9%	
136	ddd017	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	.9%	
137	ddd018	Monitor History Options	Start Cancel Delete	Specified database not found	#1	- / -	- / -	-	
138	ddd019	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 1	1 / 0	1.0%	
139	ddd020	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	.9%	
140	ddd021	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	1.0%	
141	ddd022	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	.9%	
142	ddd023	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	.9%	
143	ddd024	Monitor History Options	Start Stop Delete	Sampling OK	-	2ms / 0	1 / 0	1.0%	
144	ddd025	Monitor History Options	Start Stop Delete	Sampling OK	-	2ms / 0	1 / 0	1.0%	
145	ddd026	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	1.0%	
146	ddd027	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	1.0%	
147	ddd028	Monitor History Options	Start Stop Delete	Sampling OK	-	2ms / 1	1 / 0	1.0%	
148	ddd029	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	.9%	
149	ddd030	Monitor History Options	Start Stop Delete	Sampling OK	-	1ms / 0	1 / 0	1.0%	

ddd018 (String) - Active Alerts...
 1m 19s ago: Alert #1: Database unresponsive. Foxhound has been unable to gather samples for 10s or longer. Email not sent because Alert Emails were disabled.

-- end --