The Foxhound 4 Database Monitor

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Introduction	2
Foxhound Versus The Alternatives	3
Hallmarks of Foxhound	5
Feature: The Foxhound Menu Page	6
Feature: The Monitor Page	7
Feature: The Sample History Page	8
Feature: The Connection History Page	9
Feature: Alerts	10
Feature: Schedules	13
Usage 1: Runaway CPU Usage	14
Usage 2: Runaway Memory Usage	15
Usage 3: Large Deployments	16

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
 - o stores these statistics in its own SQL Anywhere 16 database,
 - o performs summarization and other value-added calculations, and
 - o displays the results via HTML using SQL Anywhere's built-in HTTP server.

Figure 1 shows the <u>Foxhound Monitor page</u> 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

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$\int \underline{\mathbf{M}}$ Inventory17 - Monitor Deta × +	
 € ① localhost/foxhound?t=rroad_monitor_database1.8ü1=10e78c79-3101.494b-bd09-6547d7325ea3 C Q Search ☆ 自 ♥ 	+ ☆ =
🤊 « Back to Menu Inventory17 (DSN 🔻 New Menu Schema History Foxhound Options Monitor Options About - Nov 12 2016 8:17:46AM	2
Display Paused Stop Sampling Start Sampling Monitor Refresh Display (37) Disable Refresh Enable Refresh Reset Peaks	
DBSpace Size Used Frags Avail File * Machine: XPS * Started At: 8:10:20 AM * DB 5M 4494.2% 1 458G C:\projects\foxhound_benchmark_inventory_db\inventory17.db * SPS: YYY * Database: inventory17_xps * Cache: 50M, 0% of 14G * Temp 5.3M 80.0% 11 458G C:\projects\foxhound_benchmark_inventory_db\inventory17.db * SPS: YYY	? Softwai days ? DB Fi
Response ? Throughput ? Parent, ? Executing, ? Active Req, ? Locks Held, ? Temp Space, ? Cache Panics, ? Checkpoints, ? Disl Most Recent Heartbeat, Req, Child Idle, Waiting Max Req, Conns Blocked, Rollback Log, Checkpoint Urgency, Intern Sample_Interval Sample_Ing Commuts_Bytes Conns Conns Waiting Time ? CPU	k/Cache: [®] Inco al Index, Rea <u>, Table</u> Wri
8:17:41 AM 10.1s 1ms/214ms/-21/s/.1/s/15k/s 135/-2/133/1 2/8/- 1/1/1/10s .1% of 8 2.6M/4k/1 -/-/100.00% -/12%/1% -/	-/,
[* [7,4500] * Response * * Throughput * Parent, * Executing, * * Active Req, * Locks Held, * * Temp Space, * Cache Panics, * * Checkpoints, * * Dial Recent Heartbeat, Req, Child Idle, Waiting Max Req, Conns Blocked, Conns Blocked, Rollback Log, Low Memory, Checkpoint Urgency, Intern Samples Interval Sample, Ping Commits, Bytes Conns Unsch Req Waiting Time * CPU Uncommitted Satisfaction Recovery Urgency, Leaf	k/Cache: [®] Inco al Index, Rea <u>, Table</u> Wri
B:17:41 AM 10.1s 1ms / 214ms / 21/s / .1/s / 15k/s 135 / - 2 / 133 / 1 2 / 8 / - 1 / 1 / 10s .1% of 8 2.6M / 4k / 1 - / - / 100.00% - / 12% / 1% - / 1%	-/, -/, -/, -/,
B:16:51 AM 9.9s 1ms / 210ms / - 22/s / .1/s / 15k/s 135 / - 2 / 133 / 1 2 / 8 / - 1 / 1 / 9 .9s 1% of 8 2.6M / 4k / 1 - / 100.00% - / 10% / 1% - / 1%	-/, -/, -/, -/,
¹ Connections 1 to 10 of 136 at 8:17:41 AM See <u>History</u> for more ² Click on a title below to sort it, or click here to sort on AutoDropped, 4Blocked By, Block Reason, Locked Row Que	ry, Last Stateme
* Hide Details * Throughput * Locks Held, * Temp Space, * Low Memory, * Time Since * <td>Current Reg Stati</td>	Current Reg Stati
5 / g.mikhailov / Breck / - / app 5m 2.8s - / - / - / - / 4m 57s 4m 56s / 0% / 97% / 3% - / - 28k / - / - - / 100% 4m 57s 1 Belocked By: 4 / h.barbosa / Breck / - / app -	Blocked by lock
 Block Reason: Row Transaction Intent, Row Transaction WirtENDPK lock on dbainventory Locked Row Query: SELECT * FROM dbainventory WHERE ROWID (inventory) = 30452672; Last Statement: update "inventory" set "item_count" + 102 where "item_did" = 1 Last Bain Taxt: (update Bin (darkScan inventory inventory.) 	
1/dba/Breck/-/inventory171 7m 9.4s -/-/ -//0% / 0% / 100% -/- 344k/-/- -/100% 7m 9.3s ? Last Statement: select "count" (distinct('creator" '.' ' table_name")) from "sa_locks" ("connection_property" (? >	Idle
2 / dba / Breck / - / Foxhound-Monitor-7780 Sm 20s 21/s / .099/s / 15k/s - / - / 212ms 93ms / 1% / 0% / 99% .1% / - 608k / 4k / / 100% 213ms ? Last Statement: call "froad_connection_properties"() 2 ost Plan Toxture Pla	Executing
3 / dba / Breck / - / ReloadTest 53.7s - / - / - 586ms / 0% / 0% / 100% - / - 20k / - / - - / 100% 4m 56s 2 / dba / Breck / - / ReloadTest 58.7s - / - / - 586ms / 0% / 0% / 100% - / - 20k / - / - - / 100% 4m 56s	Idle
4/h.barbosa / Breck /- / app 5m 3s - / - 1 1/ml / 4m 57s 8ms / 0% / 0% / 100% - / - 20k / - / 1 - / 100% 4m 57s 9 Last Statement: update "inventory" set "item_count" +101 where "item_idi" = 1 0 - / - 1004ate [B1 (IndexScan inventory inventory)	Idle
	•

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

Foxhound Versus The Alternatives

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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 <u>SQL Anywhere Cockpit</u> that comes with SQL Anywhere 17,
- the <u>DBConsole utility</u> that also comes with SQL Anywhere 16 and
- the Windows Performance Monitor (PERFMON) that is supported by SQL Anywhere 17.

Table 1. Cor	nparing Foxh	ound 4 With A	Alternative Pro	oducts		
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:

- 1. **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.
- 2. **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.
- 3. **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.
- 4. **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 <u>are</u> available <u>do</u> 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.

	↑Month ↑Week ↑Day ↑3 Hours ↑1	1 Hour Sample His	tory	
3	Peaks since Nov 12 8 AM: 1s/	<u>5s/- 50,986/s/24,982/s/</u>	_6M/s_ ▲	Foxhound 4 » 4. The Sample History Page » 4.5 Samples
3	[7,13293] ? Resp Heart <u>Samples Interval</u> <u>Sampl</u>	onse (? Throughput. tbeat, Req, le, Ping <u>Commits, Bytes</u>		Throughput Key, commits, bytes Throughput, also known as bandwidth, is a measure of how much work the database has performed:
	8:56:37 AM 9.6s 0ms / 2: 8:56:28 AM 10s 40ms / 6: 8:56:18 AM 10.3s 7ms / 7: 8:56:08 AM 9.8s 5ms / 4:	53ms / - 34,994/s / 18,738/s / 691ms / - 46,924/s / 23,566/s / 61ms / - 41,633/s / 20,063/s / 449ms / - 47,040/s / 23,562/s /	4.2M/s 5.5M/s 4.9M/s 5.6M/s	<u>Throughput Req</u> is the rate at which the server has started processing a new request or resumed processing an existing request during the preceding interval.
	8:55:88 AM 9.7s 5ms / 5 8:55:48 AM 10.1s 7ms / 7 8:55:38 AM 10.1s 6ms / 8 8:55:28 AM 6.4s 12ms / 6 8:55:22 AM 6.4s 12ms / 8	51ms / - 44,797/s 22,845/s 74ms / - 45,083/s 21,911/s 11ms / - 44,749/s 22,182/s 619ms / - 44,749/s 22,074/s 197ms / - - -	5.3M/s 5.3M/s 5.3M/s 5.1M/s	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.
3	Show Details	Throughput Time JReq,	Conns	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.
	Conn #, User, OS User, IP, Name C 101 / d.hoffmann / Breck / - / app 98 / z.petrauskas / Breck / - / app 103 / y.herrmann / Breck / - / app 95 / y heise / Breck / - / app	Connected Commits. Bytes 1m 39s 601/s / 298/s / 73k/s 1m 39s 563/s / 280/s / 68k/s 1m 39s 563/s / 272/s / 66k/s 1m 39s 548/s / 272/s / 66k/s	<u>Transa</u> - -	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.
	93 / s.martel / Breck / - / app 77 / i.mendoza / Breck / - / app	1m 40s 541/s / 269/s / 65k/s 1m 41s 540/s / 268/s / 65k/s	-	Throughput Req is based on the server-level Req property
	90 / w.fleischer / Breck / - / app 102 / n.collins / Breck / - / app 95 / x.benes / Breck / - / app	1m 40s 523/s / 260/s / 63k/s 1m 39s 511/s / 254/s / 62k/s 1m 39s 510/s / 254/s / 62k/s	-	(note that this is different from the connection-level Throughput Req column which is based on the connection-level ReqCountActive property)
	<u>100 / Limberg / Breck / - / app</u> 61 / f.lewis / Breck / - / app 99 / v.kutt / Breck / - / app	1m 39s 507/s / 252/s / 61k/s 1m 43s 506/s / 251/s / 61k/s 1m 39s 500/s / 248/s / 60k/s 1m 42s 408/s / 60k/s		<u>Throughput Commits</u> is the approximate rate at which commit requests have been executed by all connections in the previous interval.
	82 / n.bianchi / Breck / - / app 91 / x.levin / Breck / - / app 96 / o.nguyen / Breck / - / app	1m 41s 493/s / 245/s / 60k/s 1m 40s 483/s / 245/s / 60k/s 1m 39s 471/s / 234/s / 57k/s		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
	97 / s.girard / Breck / - / app 94 / c.vitols / Breck / - / app	1m 39s 471/s / 234/s / 57k/s 1m 40s 468/s / 233/s / 57k/s	-	performance bottleneck is preventing the database from processing client requests.

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

Feature: The Foxhound Menu Page

The <u>Menu page</u> is Foxhound's home page. The DSN tab in Figure 3 lets you pick a target database from a dropdown 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.

	host/foxhound?t=rroad	d_process_menu2&sf2=Sav	e&i C	Q Search				+ 1	r
	Foxhound ?	New Menu Foxhoun	d Options	Monitor Options	About				
	2								
<u>DSN</u>	Choose a DSN:	Inventory17			¥]	Show	all OD	BC DSNs	
String	User Id:			(optional)		ODBC	Admin	istrator]
	Password:			(optional)					
		Include system tab	oles						
Monitor									
Monitor			-						

Figure 3. The DSN Tab on the Foxhound Menu Page

Figure 4. The String Tab

F String Tab - F	Foxhound Menu × +
(Iocalhost	t/foxhound?t=rroad_process_menu2&sf2=Save&i2=N C Q. Search 🔂 🖻 🛡 🖡 🚔
For	chound 🕐 New Menu Foxhound Options Monitor Options About
2	
DSN	Choose a connection string: Inventory17_XPS
String	Enter or edit the connection string (requires DRIVER if DSN is not used)
Monitor	Name: Inventory17_XP5
	String: ENG=Inventory17_XPS; DBN=Inventory17; UID=dba; PWD=sq1; DRIVER=SQL Anywhere Native;
	Clear Show Examples Save Delete
	Password: (optional)
	Display Schema Monitor Database

Feature: The Monitor Page

The <u>Monitor page</u> 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: <u>Alert #14 Unscheduled requests</u> indicates there's a bottleneck in satisfying client requests. The <u>Max Req column</u> 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 <u>Recent Samples links</u> like 10:03:05 AM open the Sample History page positioned on the selected sample, and
- the <u>connection links</u> 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),
- <u>does</u> let you jump and scroll through the samples and the connections recorded for one sample, and
- <u>does</u> provide layout control with frames and hide/show buttons.

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



The <u>connection links</u> 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 <u>Connection History page</u> 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	
---------------------------------------	--

<u>File Edit View</u>	Hi <u>s</u> tory <u>B</u> ookmarks <u>T</u> ools <u>H</u> elp										×
$\overline{\mathbf{M}}$ Inventory	Primary - Monito 🗙 📔 Monitor Tab -	Foxhound × <u>M</u> Inventory	Primary - Monito 🗴	H InventoryPrimary	- History 🗙 💽 1	nventoryPrimary - C	onnec × +				
(Iocall	host/foxhound?t=rroad_connection_history&	sn=16577&zi=8&cis=8-489-201611	13100050-827&sf=Pick		C	Q. Search		☆	ê 🛡	↓ 俞	Ξ
« Back to	Menu InventoryPrimary (Connec	tion String) <u>New Menu</u>	Schema Monitor	History Foxhoun	d Options Monito	r Options Abou	<u>it</u> - Nov 13 201	L6 1:07:42PM			*
<u>↑Newest</u>	↑ <u>500</u> ↑ <u>100</u> ↑ <u>20</u> ↑ <u>1 sample</u>	Message	Messa	age↓ <u>1 sample</u> ↓	20↓ 100↓ 500↓	<u>Oldest</u> ↓	×				
↑Month	↑Week ↑Day <u>↑3 Hours</u> <u>↑1 Hour</u>	Connection	History	1 Hour↓ 3 Hours	s↓ Day↓ Week	Month↓	Go to:				
7 To <u>Sampl</u>	Response p Heartbeat, le Interval Sample, Ping	Throughput Image: Commits, Bytes	Parent, ^(*) Executir Child Idle, Waiti <u>Conns Conns</u>	ng, ⁽²⁾ Active Req, ng Max Req, <u>Unsch Req</u>	Icocks Held, Conns Blocked, <u>Waiting Time</u>	 ⑦ T Rol ⑦ <u>CPU</u> Un 	emp Space, ③ C Iback Log, Lo committed <u>S</u> ;	ache Panics, w Memory, atisfaction	Checkpoin Recovery	kpoints, t Urgency, <u>Urgency</u>	, Int
10:03:05 A	M 10.1s 32ms / 1.5s / - 12,76	2/s / 6,311/s / 1.6M/s 1	02/- 14/1/8	7 22 / 22 / 73	51 / - / 13.9m	23.7% of 8 1.4	M / 4k / 53 - /	- / 100.00%	- / 2% /	2,019%	
 <u>Conn #, Us</u> 489 / h.ba 	1) ser, OS User, IP, Name ② Login 3 rbosa / Breck / - / app 10:00:50	Time [?] Connection Id AM 8-489-20161113100	String 0050-827								
[8,16577] Conr	Hide Details [®] Time Dection Samples Interval Connected	Throughput Req, Commits, Bytes	Locks Held, Dons Blocked,	[®] Waiting Time, Busy, Wait, Idle	[®] CPU, Child Conns	[®] Temp Space, Rollback Log, Uncommitted	2 Low Memory, Cache Satisfaction	, 🕐 Time Sinc Last Request	e	nt Reg Sta	atus
History	10:03:05 AM 10.1s 2m 14s	131/s / 65/s / 17k/s	1/-/1.4s 1m	1 35s / 7% / 70% / 3	23% .2% / -	12k / - / 1	- / 100%	1.4s	Waitin	g for threa	d
	? Last Statement:	Show Less			and the second						
	? Last Plan Text:	update "inventory" set Show Less	"item_count" = '	"item_count"+1 whe	ere "item_id" =	100001					
		(Update [B]	(inventory)								
)	(invencory)					Last plan used	l on this conn	ection	
History	10:02:55 AM 10 10 2m 4 25	Unscheduled requests. Th	ne number of reque	ests waiting to be pr	ocessed has reac	ned 5 or more fo	r 10 or more rec	enc samples.	email not s	ent pécau	se /
<u>HISCOLY</u>	? Last Plan Text:	Show More (Undate [B]	(IndexScan inven	tory inventory))	25% .2% / -	чк/-/-	- / 100%	1.25	Waluit	g for threa	
History	10:02:45 AM 9.9s 1m 54s	110/s / 54/s / 15k/s	1/-/1.3s 1m	18s / 6% / 68% / 1	26% .1% / -	12k / - / 1	- / 100%	1.3s	Waitin	g for threa	d
	2 Last Statement:	Show More update "inver	ntory" set "item_co	ount" = "item_count"	+1 where "item_id	" = 540001			20 10	46	
1	2 Last Plan Text:	Show More (Update [B]	(IndexScan inven	tory inventory))						<i>c</i>	
History	10:02:35 AM 9.6s 1m 44s	116/s / 57/s / 15k/s	1/-/1.4s 1m	1 10s / 5% / 66% /	29% .2% / -	12k / - / 1	- / 100%	1.5s	Waitin	g for threa	b
	2 Last Statement:	Show More (Undate Inver	(IndexScan inven	tory inventory))	+1 where "item_id	= 830001					
History	10:02:25 AM 10.1s 1m 35s	113/s / 56/s / 15k/s	1/-/1.8s 1n	n .7s / 5% / 64% / 3	31% .3% / -	12k / - / 1	- / 100%	1.8s	Waitin	a for threa	be
	2 Last Statement:	Show More update "inver	ntory" set "item_co	ount" = "item_count"	+1 where "item_id	" = 10001	A10-0324530530		10		-
	2 Last Plan Text:	Show More (Update [B]	(IndexScan inven	tory inventory))							
History	10:02:15 AM 9.7s 1m 25s	108/s / 53/s / 14k/s	1/-/- 5	1.9s / 4% / 61% / 3	5% .2% / -	4k / - / -	- / 100%	1.7s	Ex	ecuting	
Linkows	2 Last Plan Text:	Show More (Update [B]	(IndexScan inven	tory inventory))	10/	104 / / 1	(1000)	24		a far three	-
HISTORY	10:02:05 AM 9.95 1M 155	94/s / 4//s / 12k/s	1/-/25 4	+35 / 4% / 5/% / 39	1% .1% / -	12K / - / 1	- / 100%	25	Waitin	g for threa	iu i
	2 Last Plan Text:	Show More (Undate INVer	(IndexScan inven	tory inventory))	T WHERE ILEM_IC	- 200001					
History	10:01:55 AM 9.8s 1m 5s	89/s / 44/s / 12k/s	1/-/1.85 34	4.1s / 3% / 52% / 4	5% .2% / -	12k / - / 1	- / 100%	1.9s	Waitin	g for threa	d +
•											+

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 <u>History</u> 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 <u>Connection Id String</u> 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 <u>Alert email</u> 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? <u>Alert #22 Conn temp file usage</u>
- 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

MAIL	Q All - Breck, search your mailbr	xc		s	Search Mail	Search V	Web		
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Compose	♠ ≪ → Archive More	ve 🗸 🍵 Delete 🛛 Spam						+	+ >
ld Gmail, Outlook,)L and more	 Alert #22 Conn temp file us 	sage - "Inventory / XPS /	inventory16_xps /	inventory1	6"			1	People
юх (2185)	Foxhound Alert <breck.carter@gm< p=""></breck.carter@gm<>	ail.com>						Today at 2:21	PM *
afts	To breckcarter@ymail.com								
nt	COMPANY OF STREET, MILLING								
hive	Foxhound Alert #22 went into effect	t for database "Inventory / XPS ,	/ inventory16_xps / inver	ntory16" at 201 file space durin	6-11-13 14:21:4	5: ont complex			
am (1)	Recent alert history	ingle connection has used 100	of more of temporary	me space dum	ig s of more lec	ent samples.			
ish (50)	Nov 13 2:21 PM: Alert #21: Temp fil	e usage. The total temporary fil	e space used by all conn	ections has bee	en 100M or large	er for 3 or mo	ore recent sample	es.	
and Monan	Nov 13 2:21 PM: Alert #22: Conn ter	mp file usage. At least one singl	e connection has used 1	.00M or more o	of temporary file	space during	3 or more recer	nt samples.	
important	Nov 13 2:21 PM: CANCELLED - Alert	t #21: Temp file usage. The tota	l temporary file space us	ed by all conne	ections has been	100M or larg	ger for 3 or more	e recent samples.	
Inroad	Nov 13 2:21 PM: CANCELLED - Alert	t #22: Conn temp file usage. At	least one single connect	ion has used 10	DOM or more of	temporary file	e space during 3	or more recent	samples
Starred	Recent sample history	DI	Space Size Used Fr	and Avail File	27 T				
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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 <u>all the Alert conditions supported in Foxhound 4</u>. 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 Crit	eria
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 (conti	nued)
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 <u>the AutoDrop process</u> that deals with runaway connections.

Figure 9. Sample Schedule

				2		
mple Schedule for InventoryPrimary (Connection String) • [Top]						
Enforce the Sample Schedule AM PM Y,y for yes, P,p for ping, oth 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9	er for no 10 11					
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12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 ve You must click one of the Save buttons if you want your changes saved.	10 11					

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 <u>Parent</u>, <u>Child Conns column</u> 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 <u>Last Plan Text field</u> 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

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③ <u>« Back to Menu</u> Inventory (Conne	ection String) 🛛 👻	New Menu Scher	ma Monitor Foxhou	und Options Monitor C	ptions About	- Nov 14 2016	10:00:53AM	
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? [10,37151] ? Samples Interval S.	Response leartbeat, ample, Ping	Throughput Req, Commits, Bytes	Parent, Execu Child Idle, Wa Conns Conr	iting, ⁽²⁾ Active Req, iting Max Req, is Unsch Reg	2 Locks Held, Conns Blocked, Waiting Time	② CPU	Temp Space, Rollback Log, Uncommitted	C Lo
<u>9:58:21 AM</u> 3.7s 1ms /	161ms / 207ms	55/s / .3/s / 29k/s	3/8 8/1	2 2/19/-	- / - / 1.9s	91.6% of 8	1.2M / - / -	- /
9:58:17 AM Alert #2	27: Connection CPU.	The approximate CP	U time has been 25%	or higher for at least	one connection	during 10 or mo	ore recent sampl	les. E
<u>9:58:17 AM</u> Alert #4 <u>9:58:17 AM</u> 37.6s 27.8s	/ 272ms / 175ms	5.6/s / - / 2.8k/s	3/8 9/1	/ 1 2 / 19 / -	- / - / 36.8s	98.7% of 8	1.2M / - / -	- /
<u>9:57:39 AM</u> 10.8s 21ms /	581ms / 436ms 1	9/s / .1/s / 9.9k/s	3/8 9 <u>/</u> 1	/1 2/10/-	- / - / 2.25	98.0% of 8	1.2M / - / -	-/ -
<			2					•
Il connections at 9:58:21 AM Query, Last Statement or Last Plan Text	Click of the second	on a title below to so	ort it, or click here to	sort on AutoDropped,	Blocked By, Blo	ck Reason, Lock	ked Row	Â
? Hide Details	•2	? Throughput	l ocks Held.			7 Temp Space.	2 Low Memory	1. (?)
	3 Time	Req,	Conns Blocked,	Waiting Time,	⑦ ↓CPU,	Rollback Log,	Cache	·
Conn #, User, OS User, IP, Name	Connected	Commits, Bytes	Transaction Time	Busy, Wait, Idle	Child Conns	Uncommitted	Satisfaction	
<u>5 / k.delacruz / Breck / - / delacruz-a</u> ? Last Sta	dhoc 4m 56s	1 -/-/-	- / - / -	- / 47% / 0% / 53%	91.4% / 8	528k / - / -	- / 100%	
	select "CO	UNT"()						
	from "in ."inve	ventory" as "a" ntory" as "b"						
2 Last Pl	an Text: Show Less							
	(Plan (Single	PowGroupBy						=
	(Exch	ange [8]						
	(51	ngleRowGroupBy NestedLoopsJoin						
		(ParallelIndexOn	lyscan (inventory	a) inventory**)				
)	(Indexontyscan (invencory b) inv	incory)				
)							
)							
5 100000093 / - / - / - / INT: Excha	nge 2m 19s	- / - / -	- / - / -	3.5s / 97% / 2% / 1%	6 11.7% / -	- / - / -	- / 100%	
5 100000095 / - / - / - / INT: Excha	nge 2m 19s	- / - / -	- / - / -	3.8s / 97% / 2% / 19	6 11.6% / -	- / - / -	- / 100%	
5 100000096 / - / - / - / INT: Excha	nge 2m 19s	- / - / -	-/-/-	3.5s / 97% / 2% / 1%	11.6% / -	- / - / -	- / 100%	
<u>5 100000098 / - / - / - / INT: Excha</u>	nge 2m 195	- / - / -	- / - / -	3.6s / 97% / 2% / 19	11.5% / -	-/-/-	- / 100%	
5 100000097 / - / - / - / INT: Excha	nge 2m 19s	- / - / -	- / - / -	5.4s / 96% / 3% / 19	6 11.3% / -	- / - / -	- / 100%	
5 100000091 / - / - / - / INT: Excha	nge 2m 19s	- / - / -	-/-/-	3.1s / 97% / 2% / 19 4.3c / 96% / 3% / 19	6 11.0% / -	- / - / -	- / 100%	-
S 100000092 / - / - / - / INT: EXCHA	III 195	- / - / -	- / - / -	7.35/90%/5%/19	0 11.070 / -	- / - / -	- / 100%	+

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 <u>Alert #22 reveals the culprit</u>: 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

ile <u>E</u> dit <u>V</u> iew Hi <u>s</u> to	ry <u>B</u> ookma	rks <u>T</u> ools <u>H</u> elp												- 0	×
$\overline{\mathbf{H}}$ Inventory - Histo	ory - Foxho	×													
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? <u>« Back to Menu</u>	Inve	ntory (Connection Str	ing) 👻	New Menu Sc	hema Mo	nitor Foxhound	Options Monito	or Options Ab	iout - Nov 1	5 2016	10:02:25	AM			2
↑ <u>Newest</u> ↑50 ↑Month ↑Wee	0 ↑100 ek ↑Day	↑20 ↑<u>1 sample</u> ↑ ↑3 Hours ↑1 Hour	Message	Sample History	Mess /	<mark>age↓ 1 sample</mark> ↓ 1 Hour↓ 3 Ho	<mark>↓ <u>20</u>↓</mark> 100↓ ours↓ Day↓ V	500↓ <u>Oldest</u> Veek↓ Month	↓ Freeze ↓ Go to:	E Frame	Heights				
 Machine: XPS Server: invo Database: invo 	5 entory16_ entory16	 ? Started At: xps ? Running Time: ? Cache: 	: 9:50:04 AM : 10.3m : 1.7G, 12% (DBSpace ? DB ? Log of 14G ? Temp	Size 70M 72 378M 98 4.3G 98	Used Frags Avai 1.3% 16 4480 3.9% 21 4480 3.6% 32 4480	File G C:\projects\fa G C:\projects\fa G C:\Users\Brec	oxhound_bench oxhound_bench k\AppData\Loo	nmark_invento nmark_invento cal\Temp\sqla	ory_db\ir ory_db\ir a0001.tm	iventory iventory	16.db 16.log	? Fav	? SPs: <u>Purge</u> : orable?	Afte
? Top <u>Sample</u>	Interval	Response Heartbeat, Sample, Ping	Through Commit Commit	ighput eq, <u>s, Bytes</u>	Parent, Child Conns	Executing, Idle, Waiting Conns	? Active Req, Max Req, <u>Unsch Req</u>	Locks H Conns Bloc Waiting T	eld, ked, i <u>me</u> ⑦ (CPU	? Temp Rollbac Uncom	Space k Log, mitted	e, 🕐 i Li	Cache ow Mei Satisfai	Panic mory, ction
10:00:24 AM (2m .8s)	1m 21s	3.4s / 48.5s / -	281/s / 12	4/s / 37k/s	104 / -	2 / 1 / 101	13 / 13 / 80	55 / - <mark>/</mark> 2h	4.1m 4.7%	o of 8	4G / 220)M / 5	5 - /	- / 10	0.00
Peaks since 9:	51:16 AM:	<u>3.4s/49.7s/-2</u>	8,494/s/14,	.179/s / 3.7M/s	104 / -	<u>19 / 103 / 102</u>	35/35/91	<u>_76 / - / _2h</u>	4.1m 51.79	<u>6 of 8</u>	4.5G / 28	6M /	70 -	/ - / 9	9.999
? [17,56266]		Response Heartbeat,	[®] Throu Re	J ghput ≊q,	[®] Parent, Child	② Executing, Idle, Waiting	Active Req, Max Req,	Conns Bloc	eld, ked,	2011	Temp Rollbac	Space k Log,	a, 🧿 (L	Cache ow Mei	Panic mory
Samples	Interval	Sample, Ping	Commit	s, Bytes	Conns	Conns	Unsch Req	Waiting T	<u>ime</u> <u>(</u>	<u>. PU</u>	Uncom	mitted	-	Satisfa	ction
9:59:03 AM 9:58:08 AM	1m 21s 54.4s 9.4s	3.45 / 48.55 / - 494ms / 43s / - 17ms / 1.4s / -	718/s / 37 72,357/s / 6,	1/s / 96k/s 159/s / 1.6M/s	104 / - 104 / -	$\frac{2}{1}$ $\frac{1}{101}$ $\frac{1}{1}$ $\frac{1}{102}$ $\frac{7}{6}$ $\frac{91}{91}$	8 / 8 / 91 16 / 16 / 41	54 / - / 20	4.7% 0.8m 5.6% 4.7m 36.49	of 8 % of 8	4G / 220 3.4G / 17 3.2G / 17	79M / -	42 - / 44 - /	- / 10 - / 10	0.00
9:57:59 AM		Alert #22: Conn temp	p file usage.	At least one sin	gle conne	tion has used 50	0M or more of te	emporary file s	pace during 1	LO or mo	re recent	samp	les. Em	ail not	sen
9:57:59 AM	6.4s	132ms / 1.9s / -	3,942/s / 1,5	57/s / 538k/s	104 / -	9 / 7 / 88	26 / 26 / 23	58 / - / 1h	18m 15.19	6 of 8	2.9G / 15	66M /	55 - /	- / 10	0.00
9:57:52 AM	1m 4.8s	268ms / 49.7s / -	704/s / 34	5/s / 94k/s	104 / -	16 / 1 / 87	26 / 26 / 69	67 / - / 2	25m 4.4%	of8	2.5G / 13	88M /	53 - /	- / 10	0.00
9:56:48 AM	0.6-	Alert #32: Rollback lo	og usage. Th	total rollback I	og space	used by all conne	ctions has been	100M or large	r for 3 or mo	re recent	t samples	s. Ema	I not s	ent be	caus
9:56:39 AM	8.05 11c	1 3c / 808mc / -	2 400/s / 5,	749/5 / 1.5M/5	104 / -	16 / 4 / 84	27/27/48	58 / - / 1b	0.2m 8.5%	of 8	$2.36 / 1_2$	5M /	2 - 1	- / 10	0.00
9:56:28 AM	41.4s	72ms / 35.8s / -	757/s / 390	0/s / 106k/s	104 / -	9/1/94	26 / 27 / 63	48 / - / 59	9.4m 5.4%	of 8 1	L.9G / 10	1M / 9	8 - /	- / 10	0.00
9:55:47 AM	46.2s	146ms / 33.6s / -	755/s / 404	4/s / 102k/s	104 / -	8/1/95	16 / 16 / 87	60 / - / 23	3.8m 5.2%	of 8	1.5G / 83	BM / 4	5 - /	- / 10	0.00
9:55:00 AM	13.5s	1s / 1.8s / -	5,360/s / 2,6	62/s / 715k/s	104 / -	17 / 3 / 84	26 / 26 / 36	50 / - / 1	8m 19.39	6 of 8	1.3G / 70	5M/4	B -/	- / 10	0.00
9:54:47 AM	10s	11ms / 1.1s / - 2	1,852/s / 10,	769/s / 2.8M/s	104 / -	17 / 3 / 84	26 / 26 / 68	50 / - / 1	.3m 51.19	% of 8	1.1G / 6	7M / 5	4 - /	- / 10	0.00
<u>9:54:37 AM</u>	2.6s	8ms / 1.2s / - 1	19,124/s / 8,	623/s / 2.5M/s	104 / -	18 / 4 / 82	26 / 26 / 40	56 / - / 4:	1.6m 45.8°	6 of 8	B33M / 5	5M / 4	6 -/	- / 10	10.00
9:54:34 AM	39.55	1.15 / 29.45 / -	3,812/S / 2,0	136/S / 502K/S	104 / -	11/3/90	32/32/5/	62/-/14	1.9m 11.69	of 8	50/M / 4	4M / 5	1 -/	- / 10	10.00
9.33.33 AM	2,95	20115 / 1.05 / * 2	(139/5/12, III	175/S/ 5.4M/S	1017/ -	14/19//1	05/ 55/ 40	<u></u>	Sign Sign		510147 3	0111/4	/	/ 10	10.00
² Connections 1 t Query, Last Stater	o 100 of 1 ment or La	.04 at 10:00:24 AM st Plan Text.	8	Next > ? Clie	ck <mark>on a</mark> tit	le below to sort i	t, or click here t	o sort on Auto	Dropped, Blo	cked By,	Block Re	eason,	Locked	Row	
³ Show Details				Through	p <mark>ut</mark>	2 Locks Held,	17 - 31 - 10 - 10 - 10 - 10 - 10 - 10 - 10			ITem	o Space,	2 Lo	w Mem	ory, 🕐	Time
Copp # Hear		ID Name	Time Connected	Req,	tor -	Conns Blocked,	Waitin Busy Wa	g Time,	Child Coppe	Rollbac	ck Log,	Sat	Cache	20	La
D (b b s b s c	, 00 03er		do 1m	Commits, by			2 20- (250)			10/01	natured	Jal	/ 10000	<u>/11</u>	Ter
2 / n.barbosa /	ck / - / E	<u>/ Darbosa-adnoc</u>	10.1m	2 5/8 / 012/6 /	1 0k/c	- / - / /m 3.55	3111 395 / 25%	/ 30% / 39%	3.3%/-	4G / 2	20MI/-		/ 100%	2	/m
1 / DBA / Breck	/ - / inve	ntorv16-1	10.2m	2.3/5/.012/5/	1.9K/S	-/-/-	- / 0% / 0%	% / 100%	- / -	232k	1-1-		/ 100%	2	10
11 / x.wang / B	reck / - /	app	9m 49s	2.5/s / 1.2/s /	.3k/s	-1-1-	6m 29s / 8% /	66% / 26%	- 1 -	32k /	- / -	1	/ 100%	, ,	48
				-,-,, -, -, -, -, -, -, -, -, -, -,					*						Þ

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 <u>Manage Multiple Monitor Sessions facility</u> 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 <u>Save and Restore Monitor Options facility</u> 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 <u>Monitor tab on the Foxhound Menu page</u> (shown in Figure 12) shows all the Foxhound monitor sessions at a glance.

Figure 1	2. The	Monitor	Tab on	the F	oxhound	Menu	Page
I Igui C I	a. inc	monitor	I ub on	une r	UNITOUTIN	menu	I uge

lhost/fo	oxhound?t=rroad_menu&z	1=4c2c3ad4-dbcc-4999-99d5-3	048521dd12f			C Q Search		\$		7	-
Foxh	ound 🕐 New Me	nu Foxhound Options	Monitor Option:	<u>s Abou</u>	t						
					[]						
3	Start All Sampling	Stop All Sampling	Refresh Displa	y (93)	Disable Refresh	Enable Refresh		2			
ID	Target Database	Open Page	Monito	r	Monitor Status	Active	Heartbeat, Unsch Req	Conns, Blocked	Time		
120	0 ddd001	Monitor History Options	Start Stop	Delete	Sampling OK	8 4 0	1ms / 0	2/0	.9%		
121	1 <u>ddd002</u>	Monitor History Options	Start Stop	Delete	Sampling OK	-	1ms / 0	1/0	1.0%		
122	2 <u>ddd003</u>	Monitor History Options	Start Stop	Delete	Sampling OK	1751	13ms / 0	1/0	.9%		
123	3 <u>ddd004</u>	Monitor History Options	Start Stop	Delete	Sampling OK		1ms / 0	1/0	.9%		
124	+ <u>000005</u>	Monitor History Options	Start Stop	Delete	Sampling OK	-	2ms / 0	1/0	1.0%		
125	5 ddd007	Monitor History Options	Start Stop	Delete	Sampling OK	-	2ms / 0	1/0	.9%		
12	7 ddd008	Monitor History Options	Start Stop	Delete	Sampling OK	-	2ms / 0	1/0	1.0%		
128	3 ddd009	Monitor History Options	Start Stop	Delete	Sampling OK		0ms / 0	1/0	.9%		
129	9 ddd010	Monitor History Options	Start Stop	Delete	Sampling OK	-	1ms / 0	1/0	.9%		
130	0 ddd011	Monitor History Options	Start Stop	Delete	Sampling OK	(40) (40)	1ms / 0	1/0	.9%		
13	1 ddd012	Monitor History Options	Start Stop	Delete	Sampling OK	(<u>_</u>)	0ms / 0	1/0	.9%		
132	2 ddd013	Monitor History Options	Start Stop	Delete	Sampling OK	1770)	1ms / 0	1/0	.9%		
133	3 <u>ddd014</u>	Monitor History Options	Start Stop	Delete	Sampling OK	-	1ms / 0	1/0	1.0%		
134	4 ddd015	Monitor History Options	Start Stop	Delete	Sampling OK	-	1ms / 0	1/0	.9%		
135	5 <u>ddd016</u>	Monitor History Options	Start Stop	Delete	Sampling OK	-	1ms / 0	1/0	.9%		
136	5 <u>ddd017</u>	Monitor History Options	Start Stop	Delete	Sampling OK		1ms / 0	1/0	.9%		
137	/ <u>aaa018</u>	Monitor History Options	Start Cancel	Delete	Specified databa	se not found #1	-/-	-/-	-		
130	000019	Monitor History Options	Start Stop	Delete	Sampling OK	570	1ms / 1	1/0	1.0%		
140	1 ddd020	Monitor History Options	Start Stop	Delete	Sampling OK	-	1ms / 0	1/0	1.0%		
14	1 ddd022	Monitor History Options	Start Stop	Delete	Sampling OK	20	1ms / 0	1/0	.9%		
143	2 ddd023	Monitor History Options	Start Stop	Delete	Sampling OK		1ms / 0	1/0	.9%		
143	3 ddd024	Monitor History Options	Start Stop	Delete	Sampling OK	-	2ms / 0	1/0	1.0%		
144	4 ddd025	Monitor History Options	Start Stop	Delete	Sampling OK	(_)	2ms / 0	1/0	1.0%		
145	5 ddd026	Monitor History Options	Start Stop	Delete	Sampling OK	-	1ms / 0	1/0	1.0%		
146	5 ddd027	Monitor History Options	Start Stop	Delete	Sampling OK	5 <u>1</u> 3	1ms / 0	1/0	1.0%		
147	7 <u>ddd028</u>	Monitor History Options	Start Stop	Delete	Sampling OK	-	2ms / 1	1/0	1.0%		
148	3 ddd029	Monitor History Options	Start Stop	Delete	Sampling OK	578	1ms / 0	1/0	.9%		
149	9 ddd030	Monitor History Options	Start Stop	Delete	Sampling OK	-	1ms / 0	1/0	1.0%		
dd	d018 (String) - Active 1m 19s ago: Alert # disabled	e Alerts 1: Database unresponsive	. Foxhound ha	as been	unable to gather sa	amples for 10s or long	e <mark>r. E</mark> mail not	sent bec	ause Aler	t Em	a