




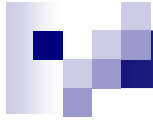
# Scatter Charts

Mike Kelly  
IWST February 2005



*“With an order of magnitude fewer variables it could be a science, but for now there is a heavy reliance on the human brain to draw relationships based on previous exposure.”*

- Scott Barber



# Scatter Chart 101



# Response vs. Time Scatter Chart

Good for:

- Identifying patterns in response times over a whole run.
- Graphically displaying response times vs. goals.
- Graphically displaying response times vs. resources.
- Highlighting select instances of poor performance.
- Can be overlaid with component/resource data.
- Identifying correlations between response times and resource usage during over time.
- Technical stakeholders.

Courtesy of Scott Barber



# Response vs. Time Scatter Chart

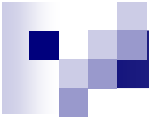
Not good for:

- Results from multiple tests
- “Low tech” stakeholders

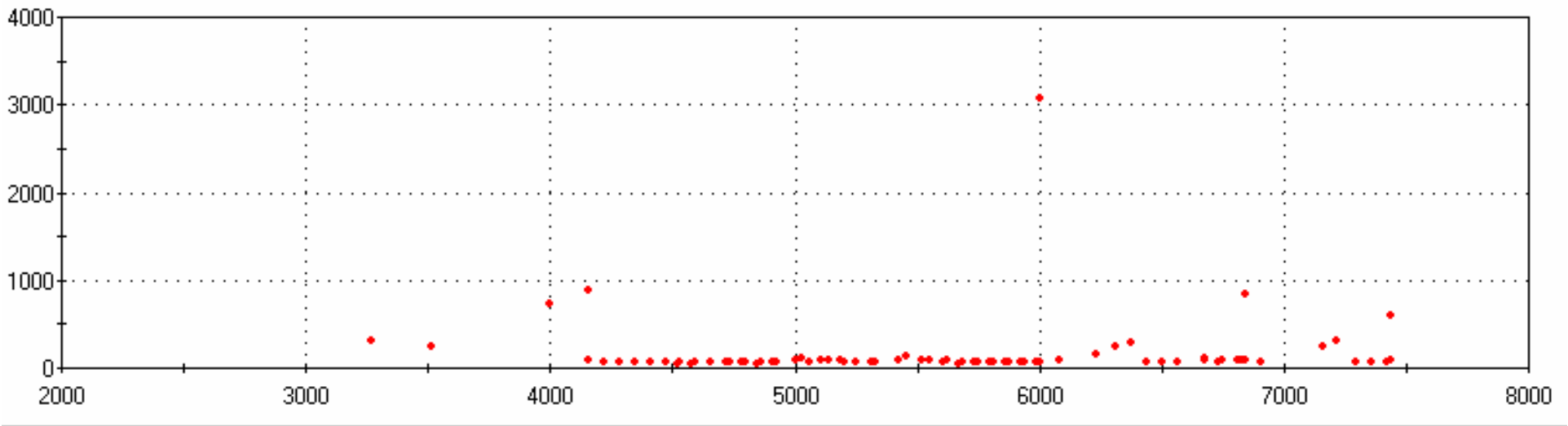


# Simple Test

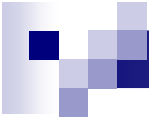
- Open BookPool.com
- Search for a book
- Click Add to Cart
- Exit



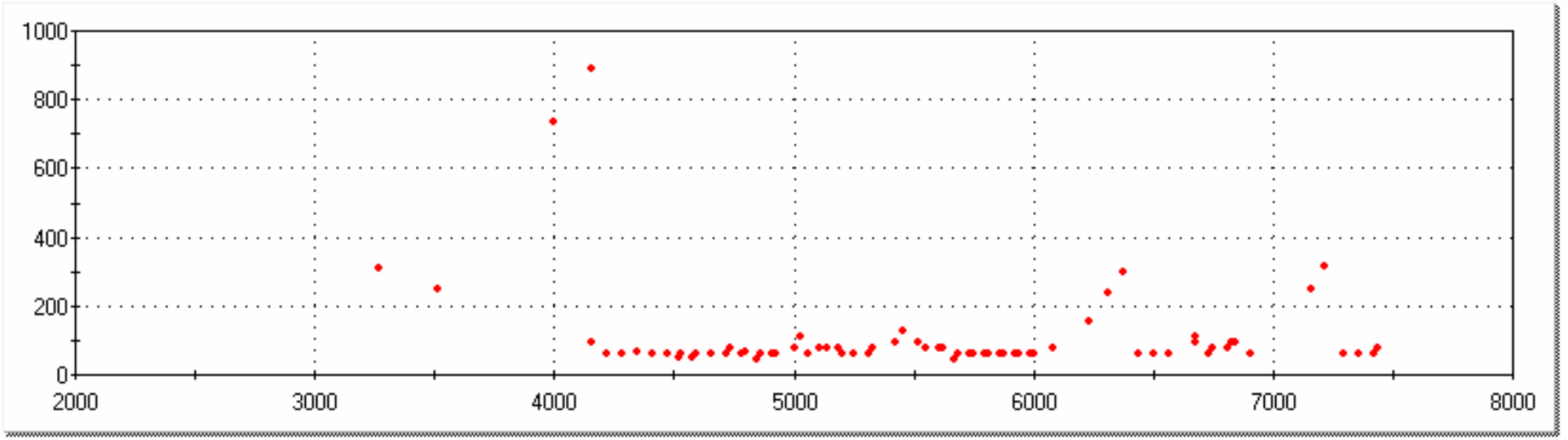
# One User



All data points shown

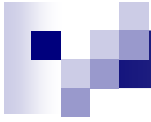


# One User

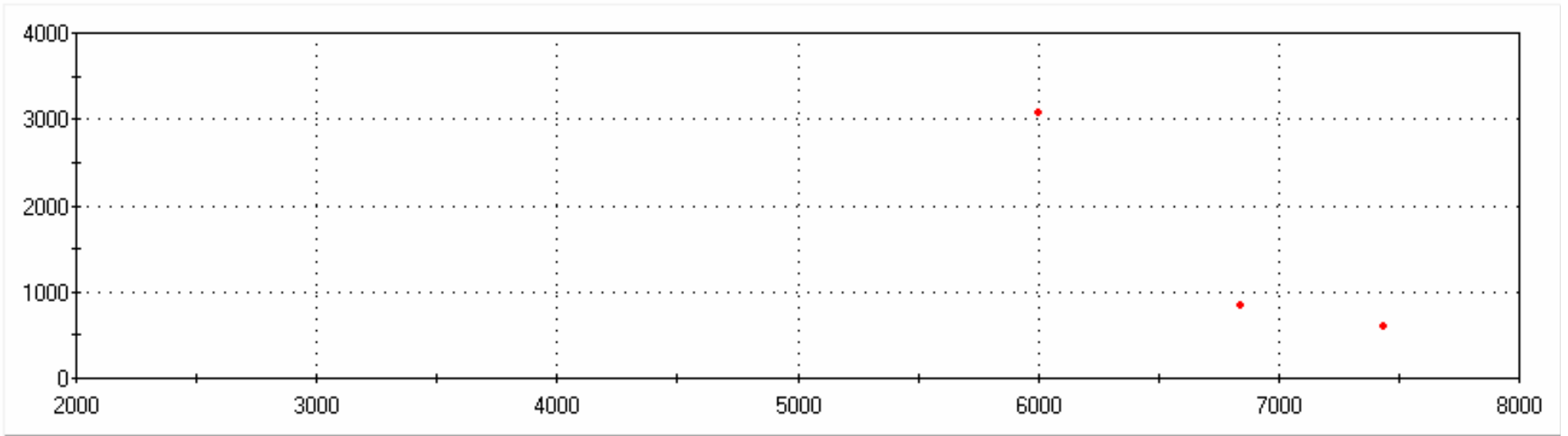


Transactions only

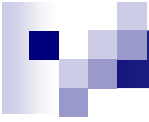




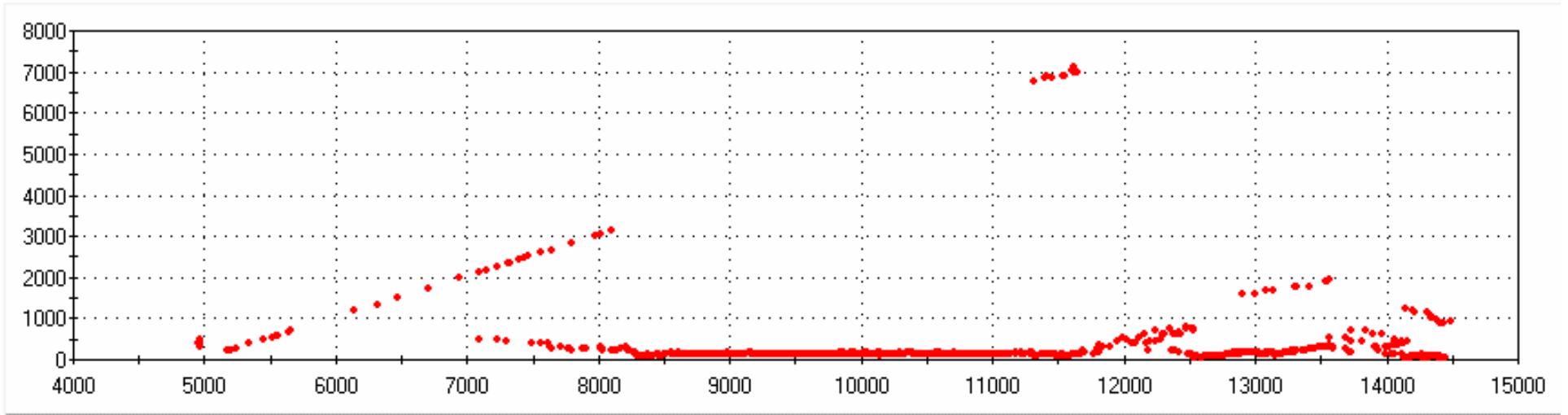
# One User



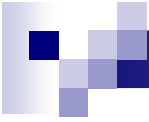
Timers only



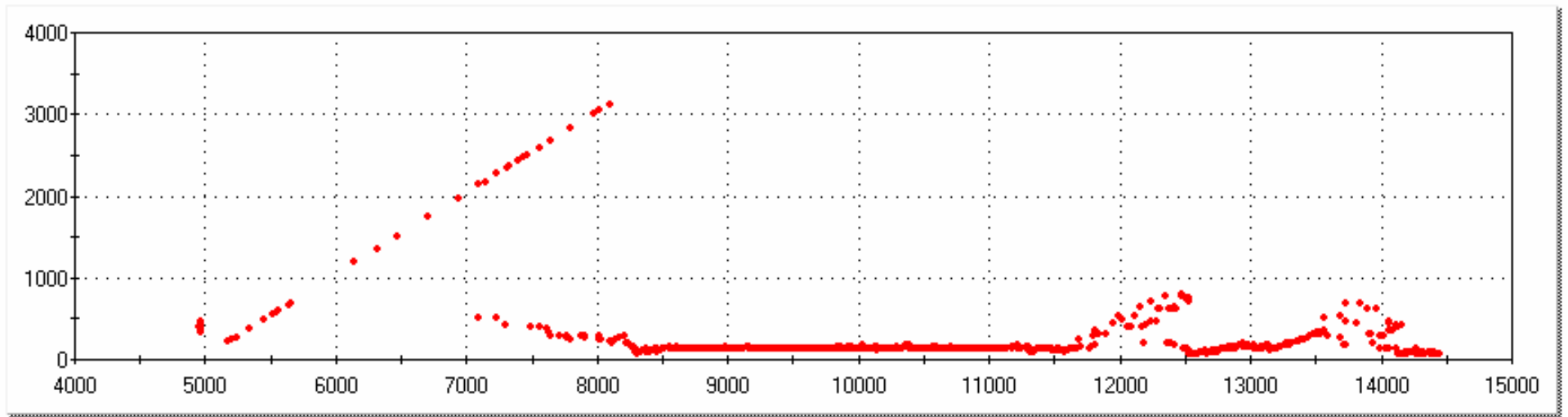
# Ten Users



All data points shown



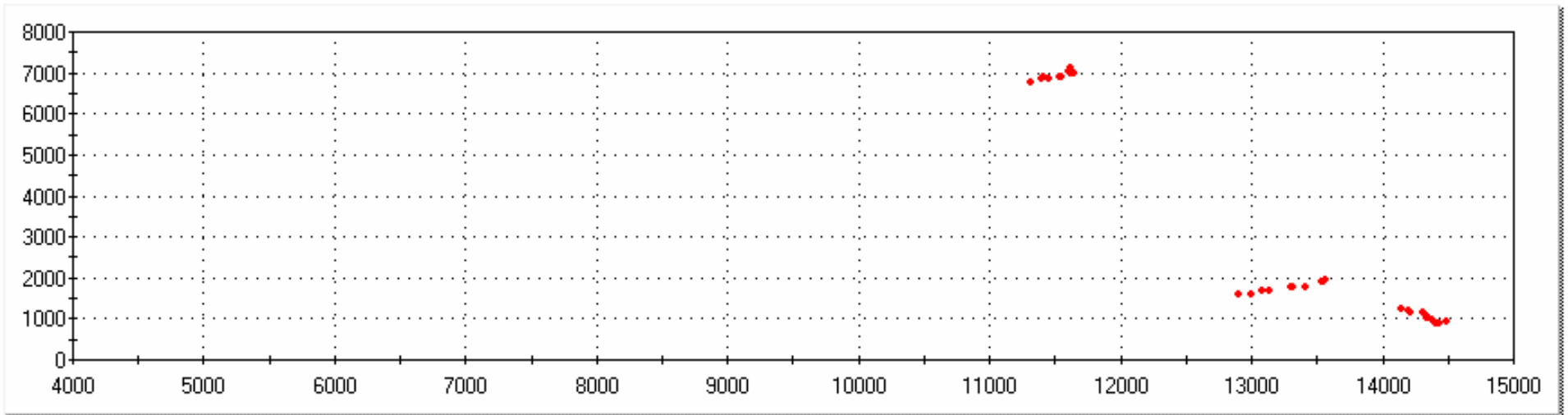
# Ten Users



Transactions only



# Ten Users



Timers only

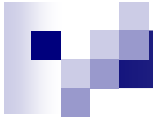
The chart just represents a table of data points...

	Cmd ID	Ending TS	Response	Status	Virtual Tester	Script
1	IwST_Sa~001	2329	95	Pass	VU User Group1[1]	IwST_Sampl
2	IwST_Sa~002	2501	172	Pass	VU User Group1[1]	IwST_Sampl
3	IwST_Sa~001	2532	94	Pass	VU User Group1[2]	IwST_Sampl
4	IwST_Sa~002	2688	156	Pass	VU User Group1[2]	IwST_Sampl
5	IwST_Sa~001	2766	93	Pass	VU User Group1[3]	IwST_Sampl
6	IwST_Sa~003	2828	499	Pass	VU User Group1[1]	IwST_Sampl
7	IwST_Sa~002	2969	203	Pass	VU User Group1[3]	IwST_Sampl
8	IwST_Sa~001	3017	126	Pass	VU User Group1[4]	IwST_Sampl
9	IwST_Sa~004	3017	111	Pass	VU User Group1[1]	IwST_Sampl
10	IwST_Sa~005	3017	688	Pass	VU User Group1[1]	IwST_Sampl
11	IwST_Sa~003	3078	546	Pass	VU User Group1[2]	IwST_Sampl
12	IwST_Sa~006	3094	77	Pass	VU User Group1[1]	IwST_Sampl
13	IwST_Sa~002	3203	186	Pass	VU User Group1[4]	IwST_Sampl
14	IwST_Sa~008	3203	94	Pass	VU User Group1[1]	IwST_Sampl
15	IwST_Sa~004	3219	78	Pass	VU User Group1[2]	IwST_Sampl
16	IwST_Sa~005	3250	718	Pass	VU User Group1[2]	IwST_Sampl
17	IwST_Sa~010	3298	95	Pass	VU User Group1[1]	IwST_Sampl
18	IwST_Sa~001	3329	140	Pass	VU User Group1[5]	IwST_Sampl
19	IwST_Sa~006	3329	110	Pass	VU User Group1[2]	IwST_Sampl
20	IwST_Sa~009	3329	126	Pass	VU User Group1[1]	IwST_Sampl
21	IwST_Sa~003	3391	625	Pass	VU User Group1[3]	IwST_Sampl
22	IwST_Sa~008	3422	93	Pass	VU User Group1[2]	IwST_Sampl
23	IwST_Sa~013	3422	93	Pass	VU User Group1[1]	IwST_Sampl
24	IwST_Sa~016	3422	93	Pass	VU User Group1[1]	IwST_Sampl
25	IwST_Sa~002	3531	202	Pass	VU User Group1[5]	IwST_Sampl
26	IwST_Sa~010	3531	109	Pass	VU User Group1[2]	IwST_Sampl
27	IwST_Sa~019	3531	109	Pass	VU User Group1[1]	IwST_Sampl
28	IwST_Sa~022	3531	109	Pass	VU User Group1[1]	IwST_Sampl
29	IwST_Sa~009	3547	125	Pass	VU User Group1[2]	IwST_Sampl
30	IwST_Sa~001	3579	140	Pass	VU User Group1[6]	IwST_Sampl
31	IwST_Sa~004	3579	109	Pass	VU User Group1[3]	IwST_Sampl
32	IwST_Sa~005	3594	828	Pass	VU User Group1[3]	IwST_Sampl
33	IwST_Sa~003	3642	625	Pass	VU User Group1[4]	IwST_Sampl
34	IwST_Sa~025	3642	111	Pass	VU User Group1[1]	IwST_Sampl
35	IwST_Sa~028	3642	111	Pass	VU User Group1[1]	IwST_Sampl
36	IwST_Sa~006	3656	77	Pass	VU User Group1[3]	IwST_Sampl
37	IwST_Sa~013	3656	109	Pass	VU User Group1[2]	IwST_Sampl
38	IwST_Sa~016	3672	109	Pass	VU User Group1[2]	IwST_Sampl
39	IwST_Sa~031	3734	92	Pass	VU User Group1[1]	IwST_Sampl



or...

	Cmd ID	Ending TS	Response	Status	Virtual Tester	Script
1	TimeToLoadHomePage	6281	4047	Pass	VU User Group1[1]	IwST_Sampl
2	TimeToLoadHomePage	6688	4250	Pass	VU User Group1[2]	IwST_Sampl
3	TimeToLoadHomePage	7047	4374	Pass	VU User Group1[3]	IwST_Sampl
4	TimeToLoadHomePage	7298	4407	Pass	VU User Group1[4]	IwST_Sampl
5	TimeToSearch	7720	1439	Pass	VU User Group1[1]	IwST_Sampl
6	TimeToLoadHomePage	7797	4608	Pass	VU User Group1[5]	IwST_Sampl
7	TimeToLoadHomePage	7984	4545	Pass	VU User Group1[6]	IwST_Sampl
8	TimeToSearch	8064	1376	Pass	VU User Group1[2]	IwST_Sampl
9	TimeToLoadHomePage	8314	4626	Pass	VU User Group1[7]	IwST_Sampl
10	TimeToSearch	8391	1344	Pass	VU User Group1[3]	IwST_Sampl
11	TimeToLoadHomePage	8531	4593	Pass	VU User Group1[8]	IwST_Sampl
12	TimeToAddToCart	8547	827	Pass	VU User Group1[1]	IwST_Sampl
13	TimeToSearch	8626	1328	Pass	VU User Group1[4]	IwST_Sampl
14	TimeToLoadHomePage	8767	4579	Pass	VU User Group1[9]	IwST_Sampl
15	TimeToAddToCart	8876	812	Pass	VU User Group1[2]	IwST_Sampl
16	TimeToLoadHomePage	8922	4500	Pass	VU User Group1[10]	IwST_Sampl
17	TimeToSearch	9094	1297	Pass	VU User Group1[5]	IwST_Sampl
18	TimeToAddToCart	9141	750	Pass	VU User Group1[3]	IwST_Sampl
19	TimeToSearch	9220	1236	Pass	VU User Group1[6]	IwST_Sampl
20	TimeToAddToCart	9329	703	Pass	VU User Group1[4]	IwST_Sampl
21	TimeToSearch	9453	1139	Pass	VU User Group1[7]	IwST_Sampl
22	TimeToSearch	9688	1157	Pass	VU User Group1[8]	IwST_Sampl
23	TimeToAddToCart	9766	672	Pass	VU User Group1[5]	IwST_Sampl
24	TimeToSearch	9845	1078	Pass	VU User Group1[9]	IwST_Sampl
25	TimeToAddToCart	9859	639	Pass	VU User Group1[6]	IwST_Sampl
26	TimeToSearch	9969	1047	Pass	VU User Group1[10]	IwST_Sampl
27	TimeToAddToCart	10031	578	Pass	VU User Group1[7]	IwST_Sampl
28	TimeToAddToCart	10235	547	Pass	VU User Group1[8]	IwST_Sampl
29	TimeToAddToCart	10344	499	Pass	VU User Group1[9]	IwST_Sampl
30	TimeToAddToCart	10470	501	Pass	VU User Group1[10]	IwST_Sampl



# Identifying Patterns



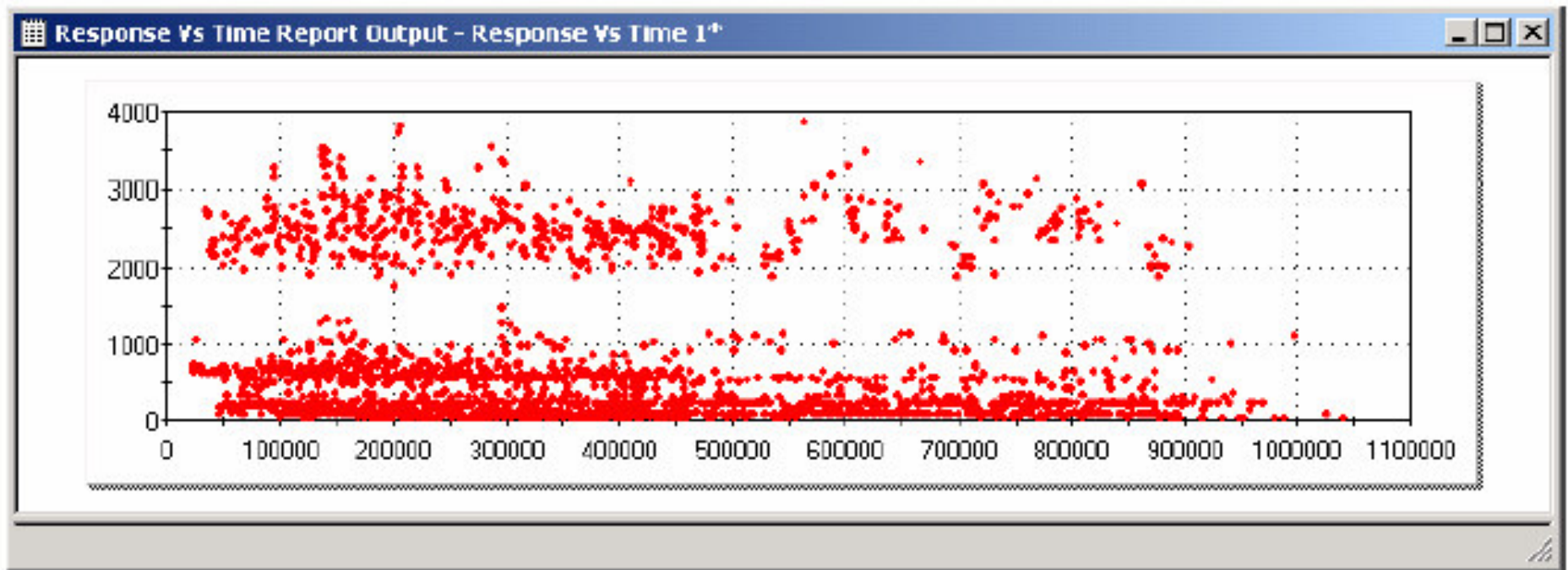
# Beyond Performance Testing – Part 6

## Interpreting Scatter Charts

By Scott Barber

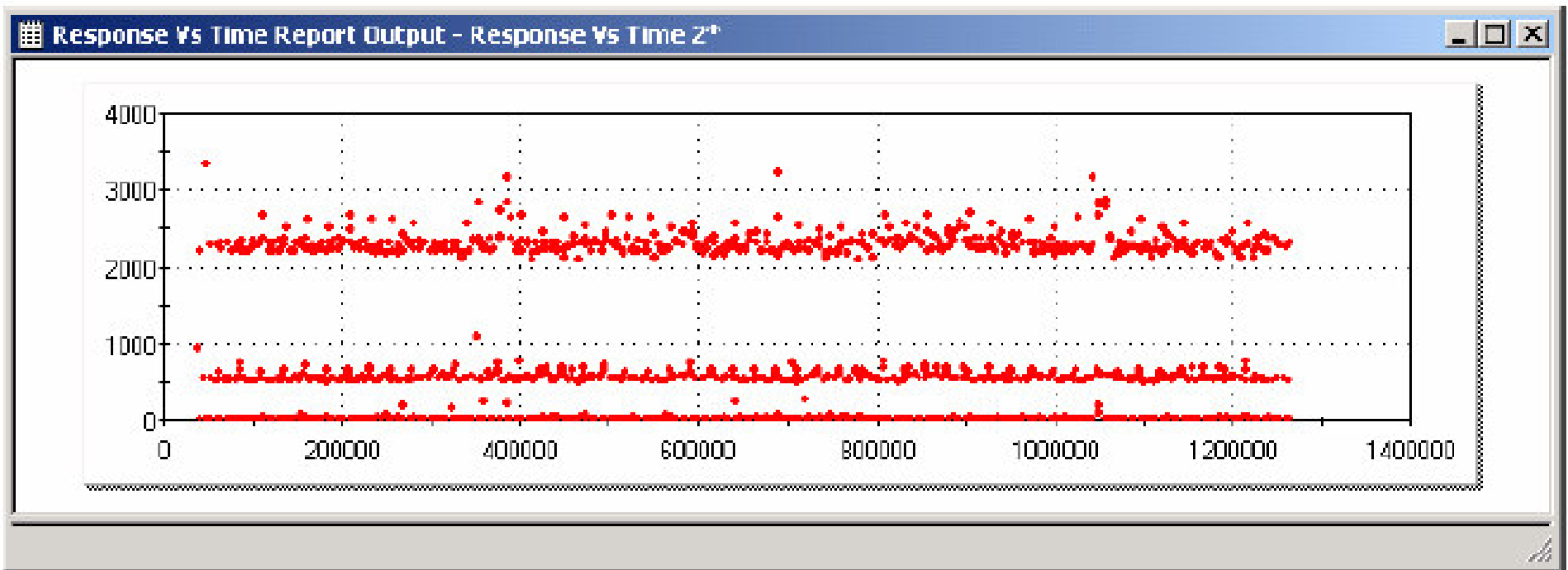


# A “Good” Pattern



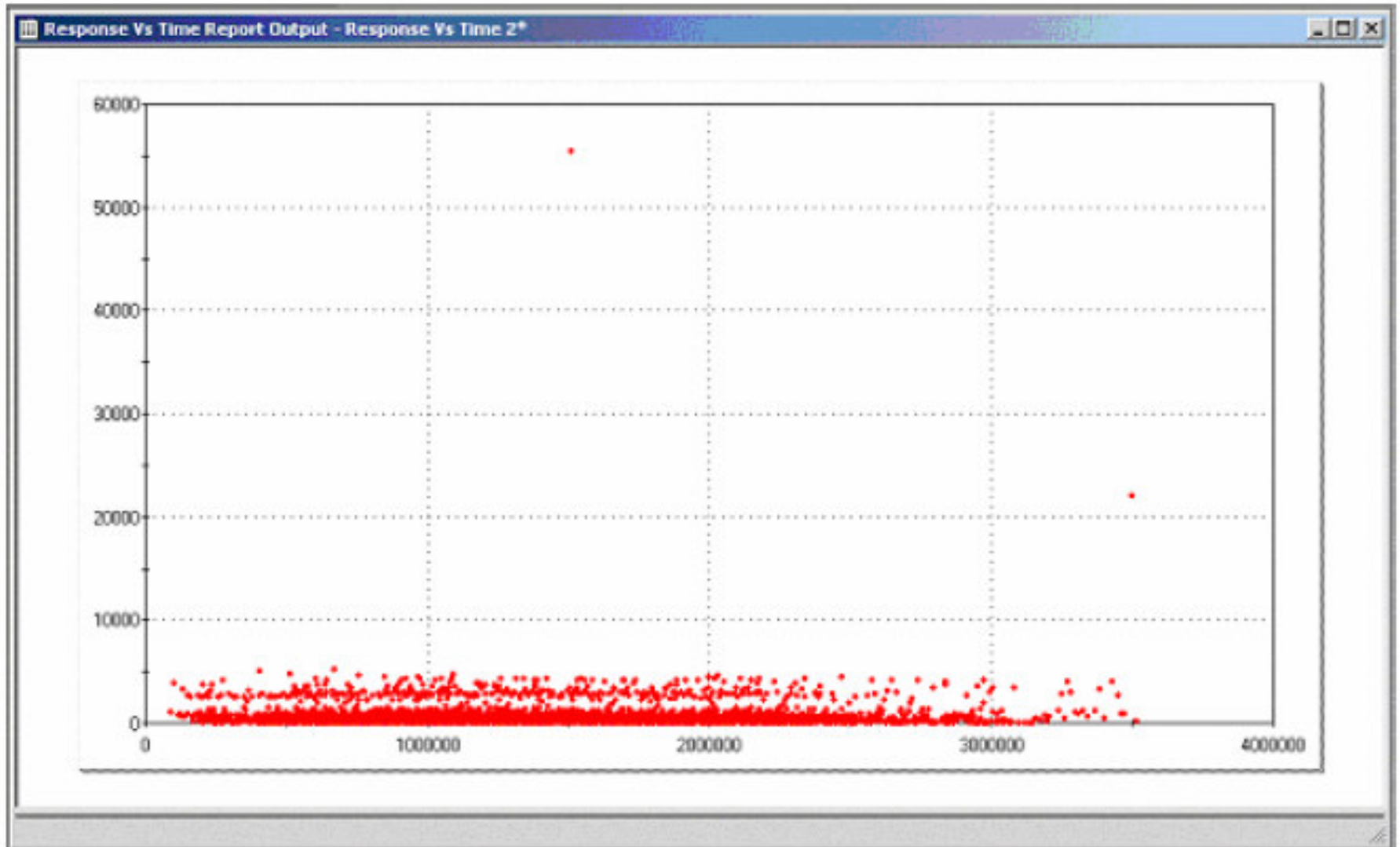
Courtesy of Scott Barber

# A “Banding” Pattern



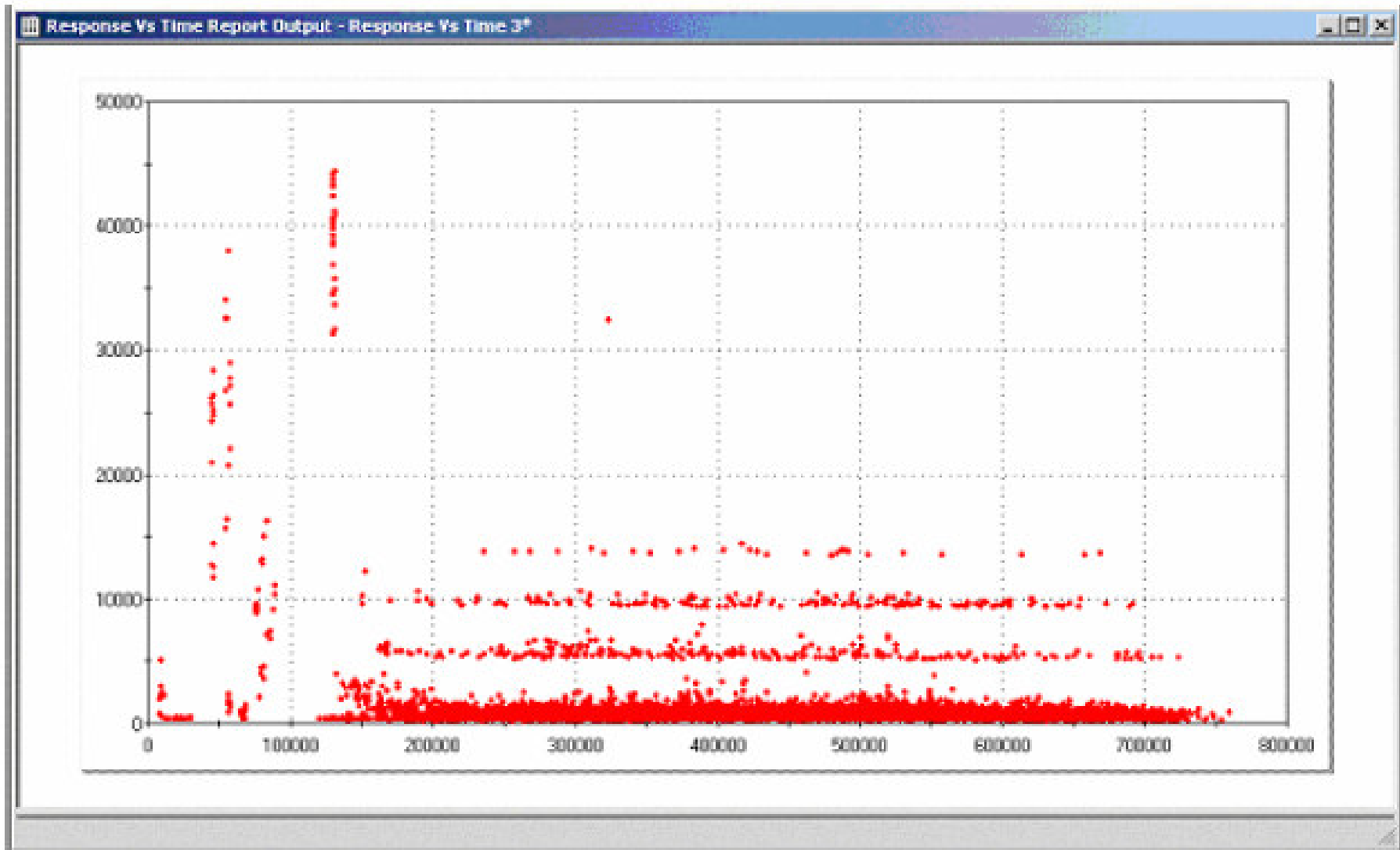
Courtesy of Scott Barber

# An “Outlier” Pattern



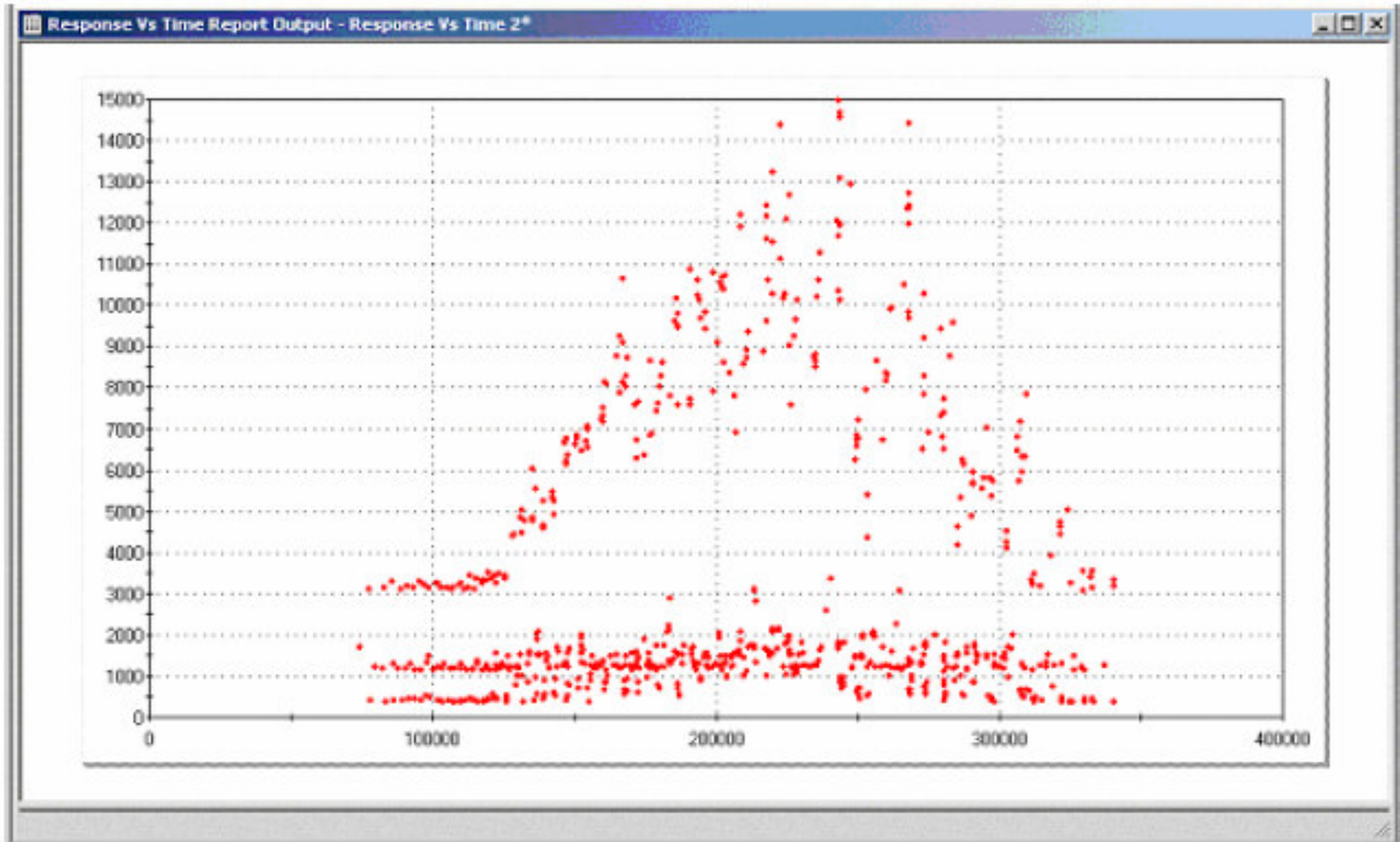
Courtesy of Scott Barber

# A “Caching” Pattern



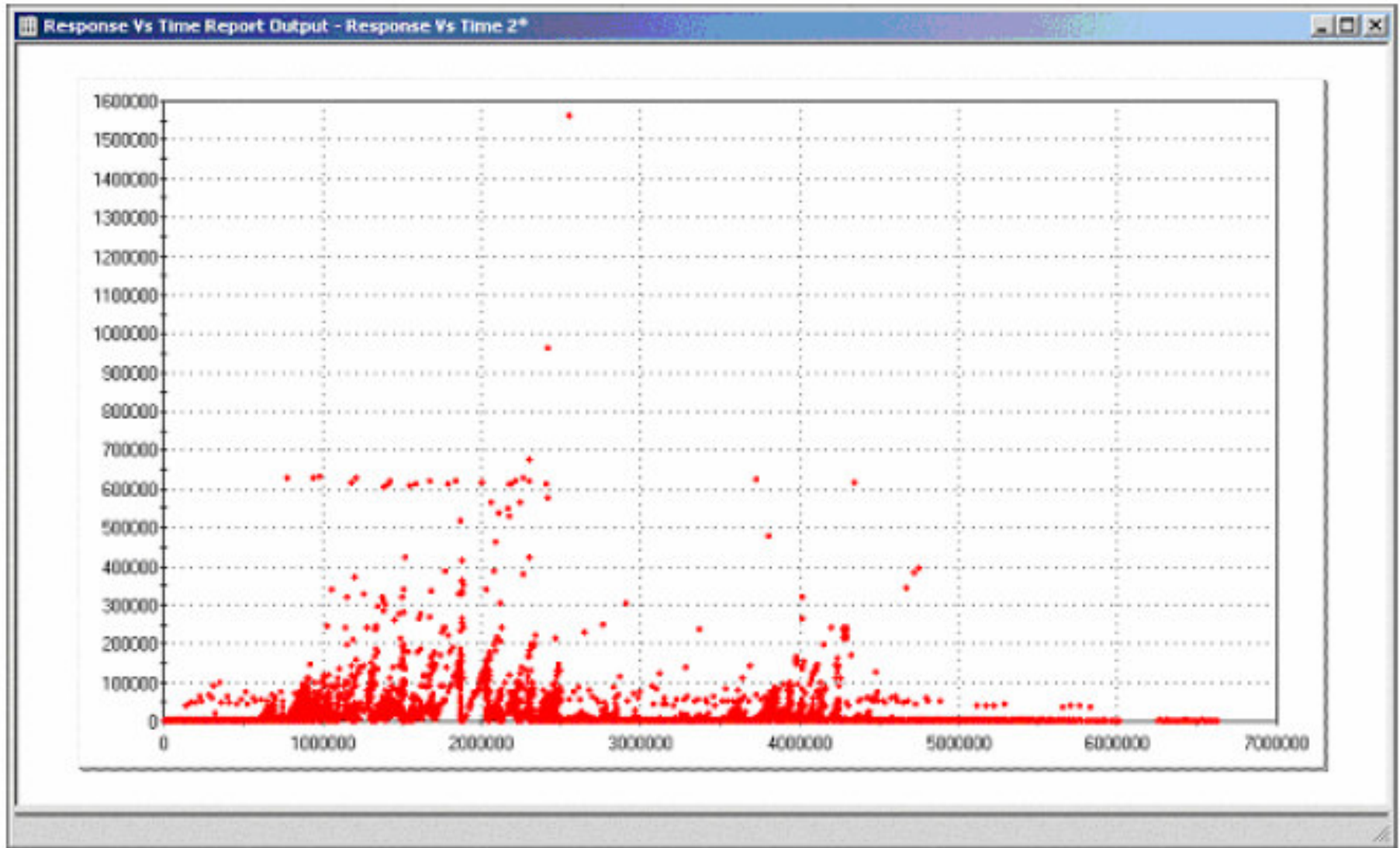
Courtesy of Scott Barber

# A “Classic Slowdown” Pattern



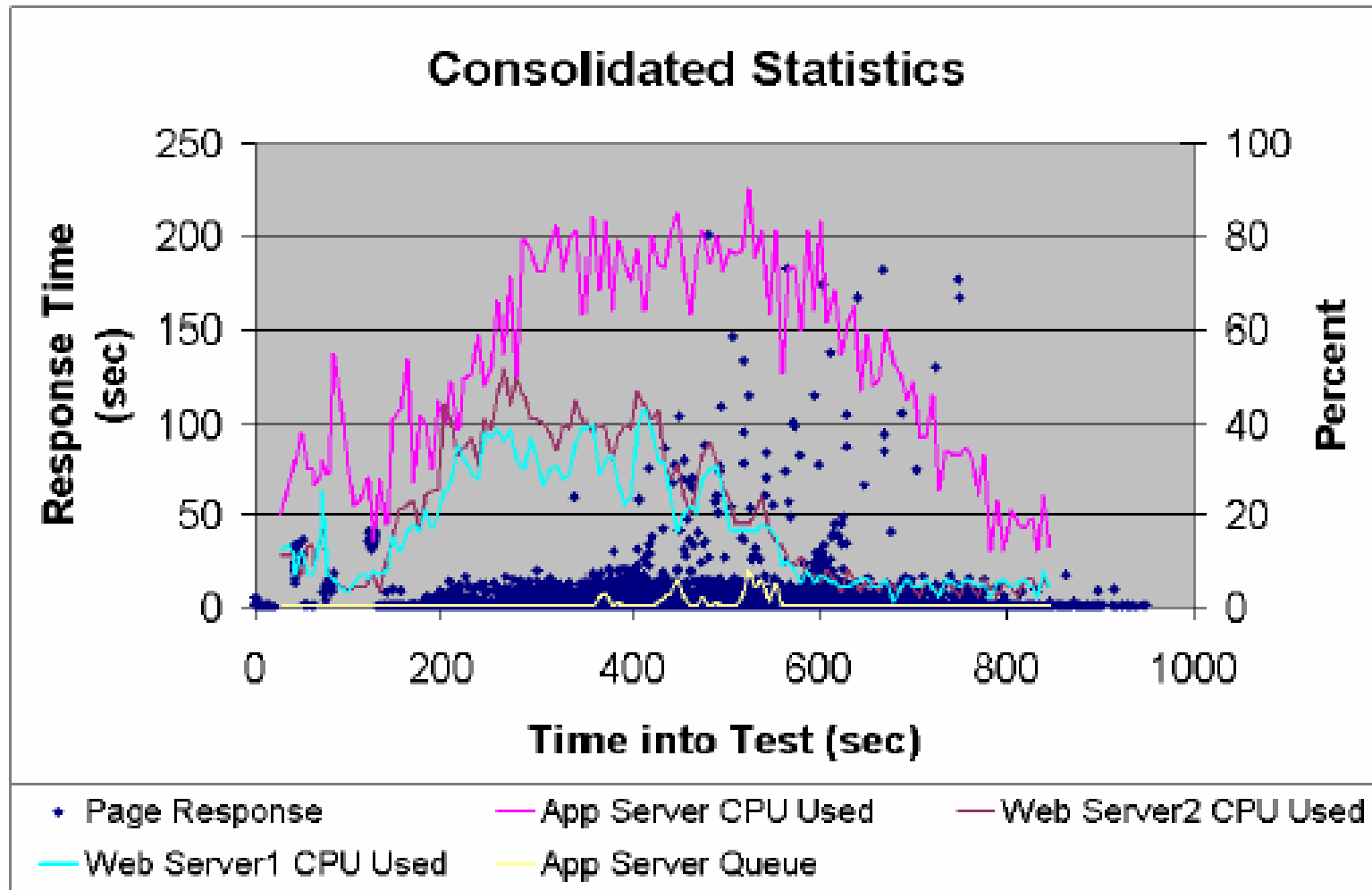
Courtesy of Scott Barber

# A “Stacking” Pattern



Courtesy of Scott Barber

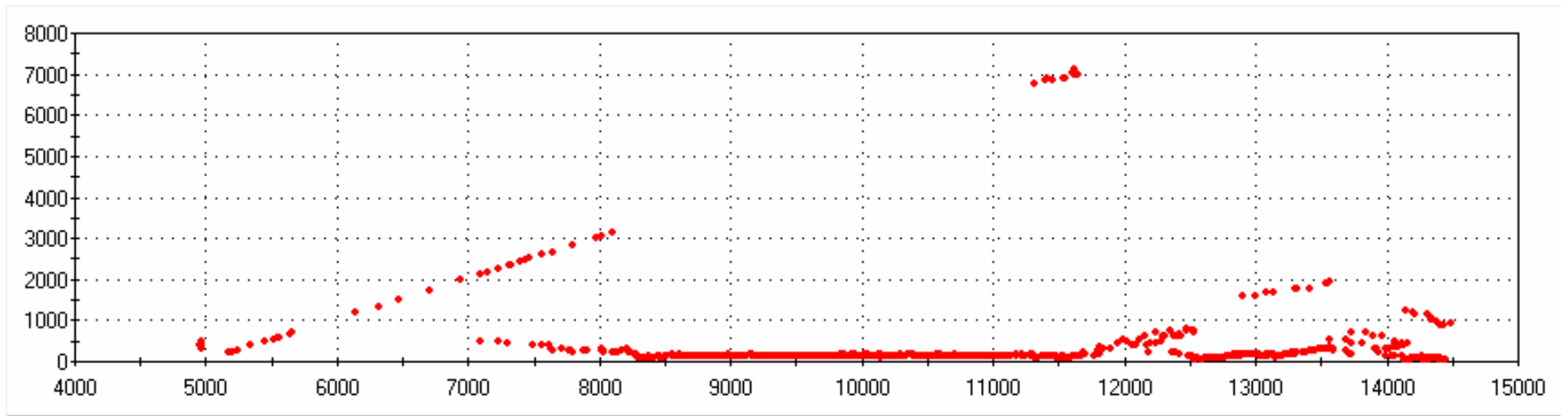
# Consolidated Scatter Chart



Courtesy of Scott Barber

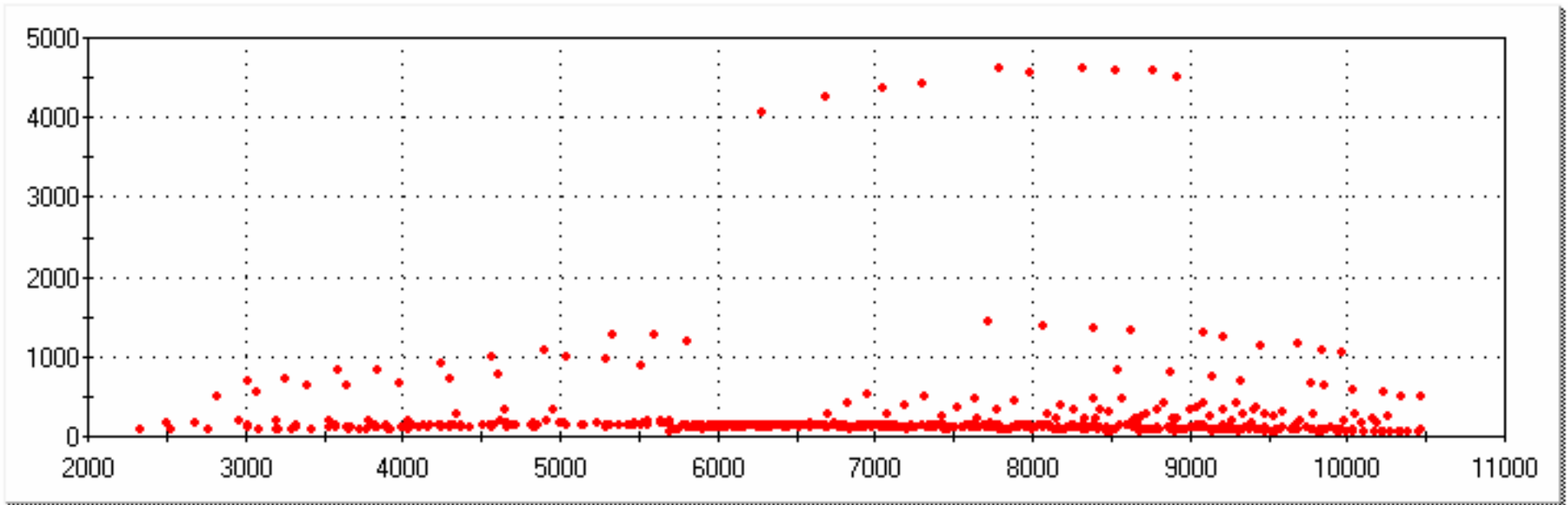


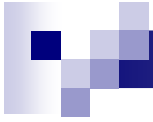
# What pattern did we see?





# Staggered Start Time





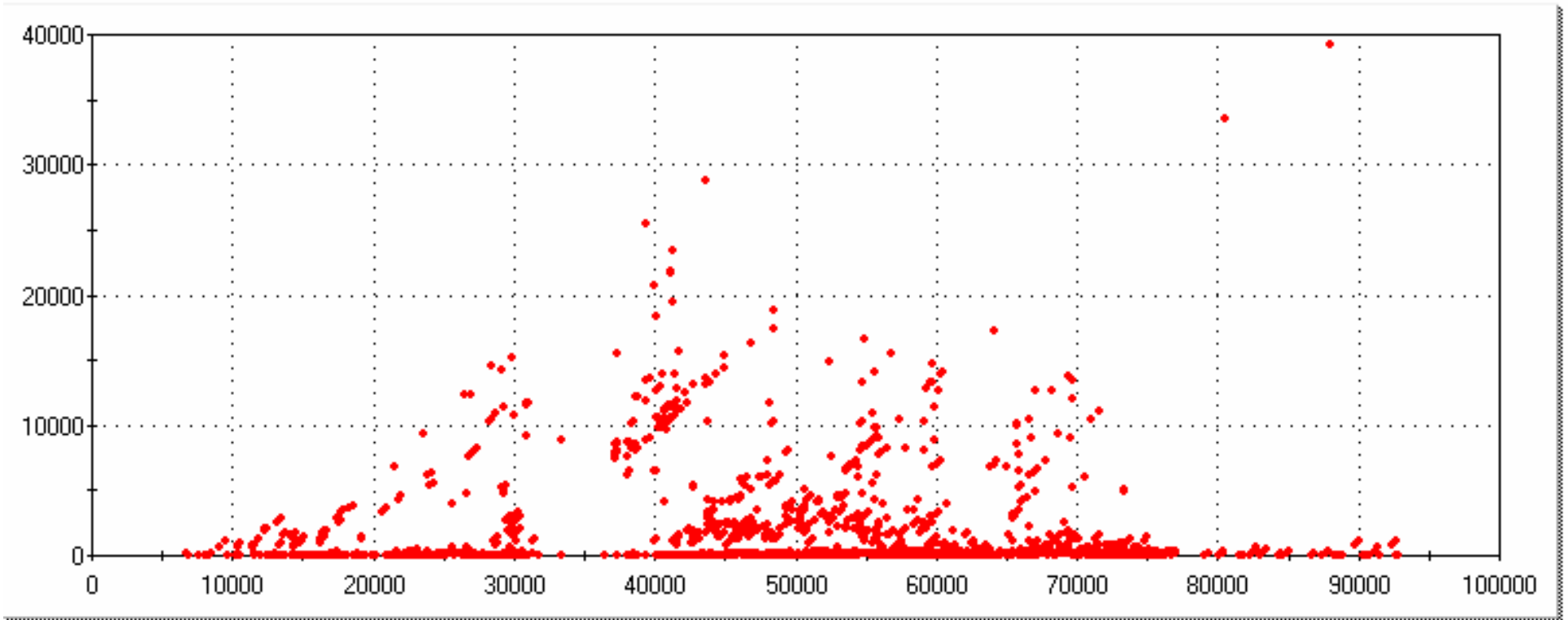
# Real Examples



Samples from one of my past projects.

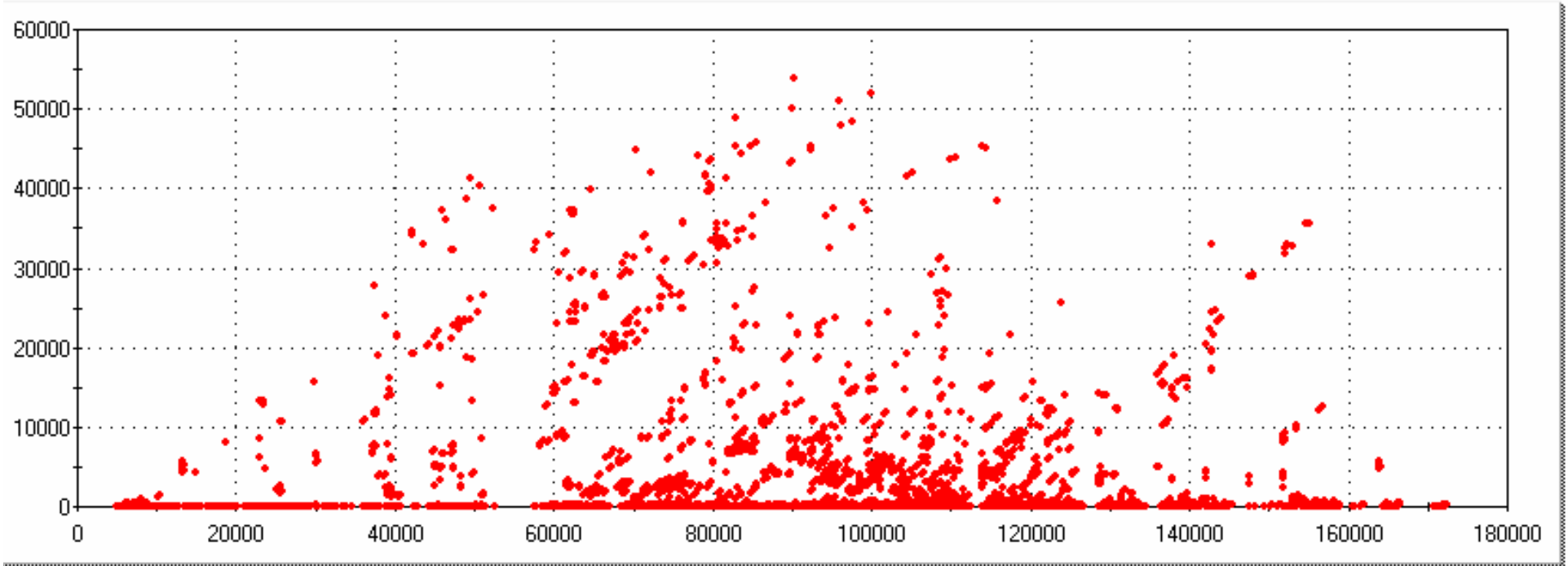


# 50 Users

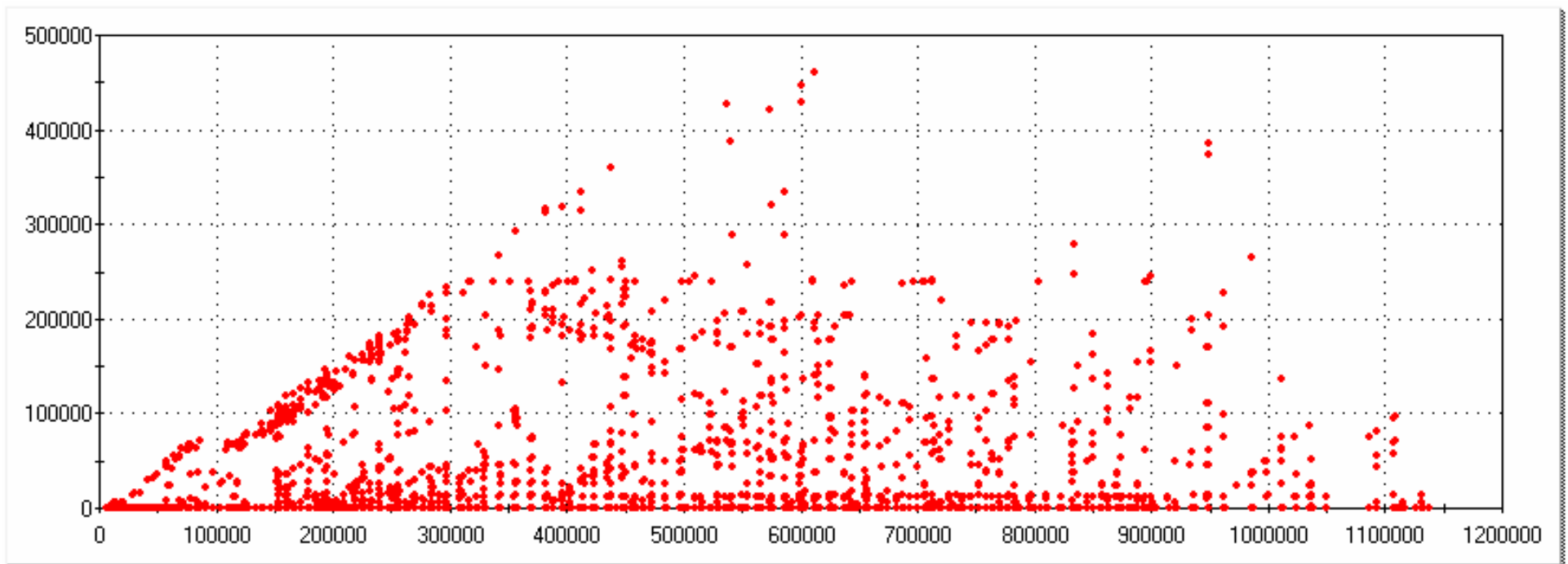




# 100 Users

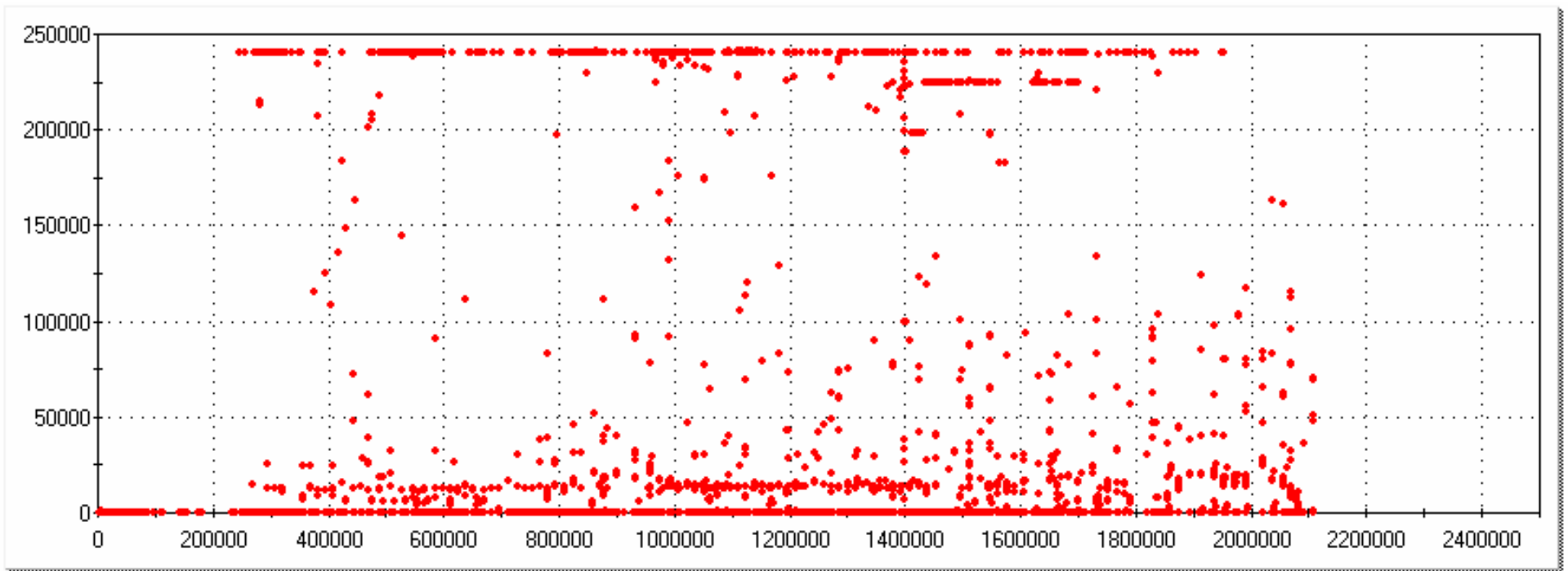



# 150 Users





# 200 Users

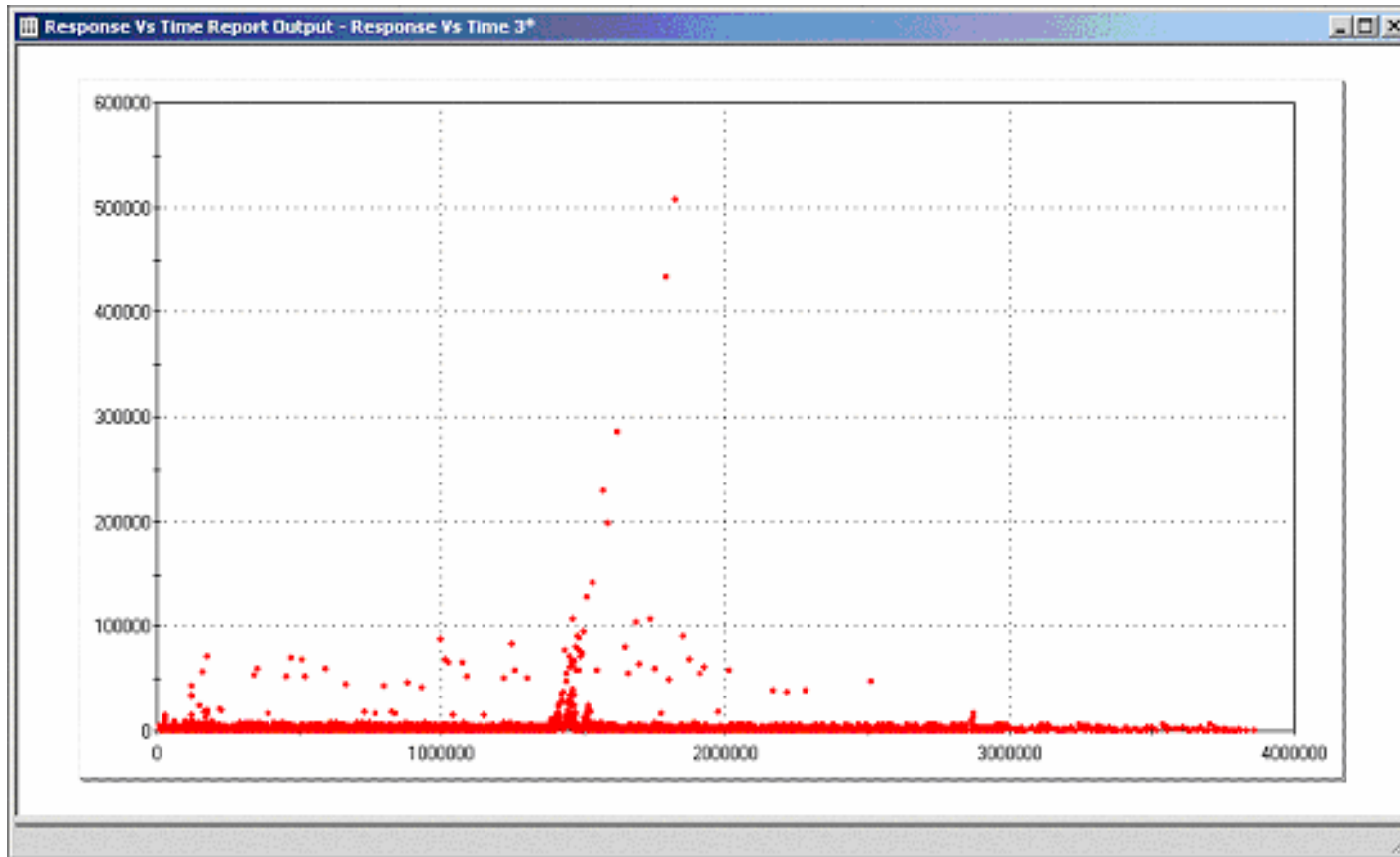




Unique samples shared by Scott Barber  
from some of his past projects.

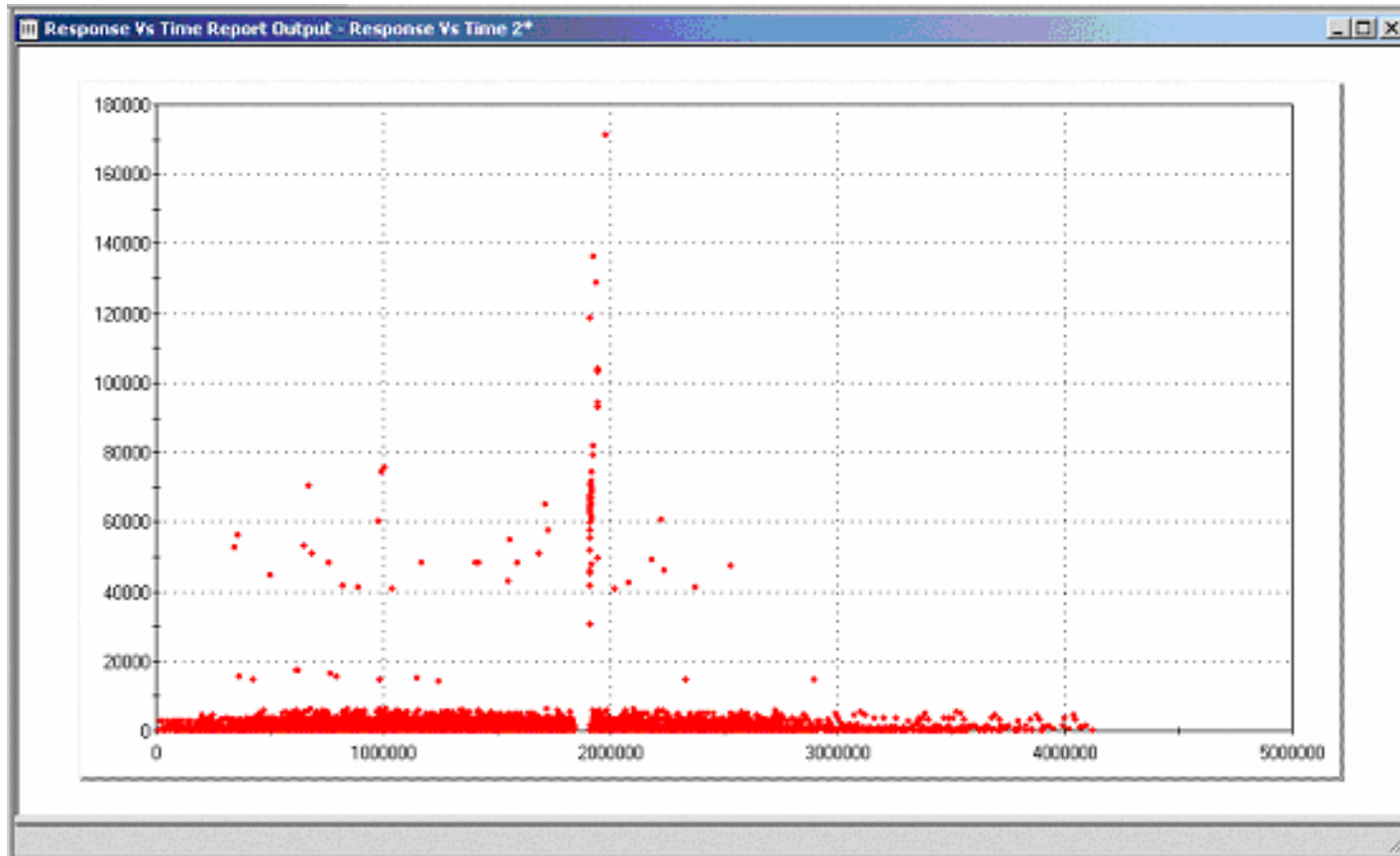


# Batch process



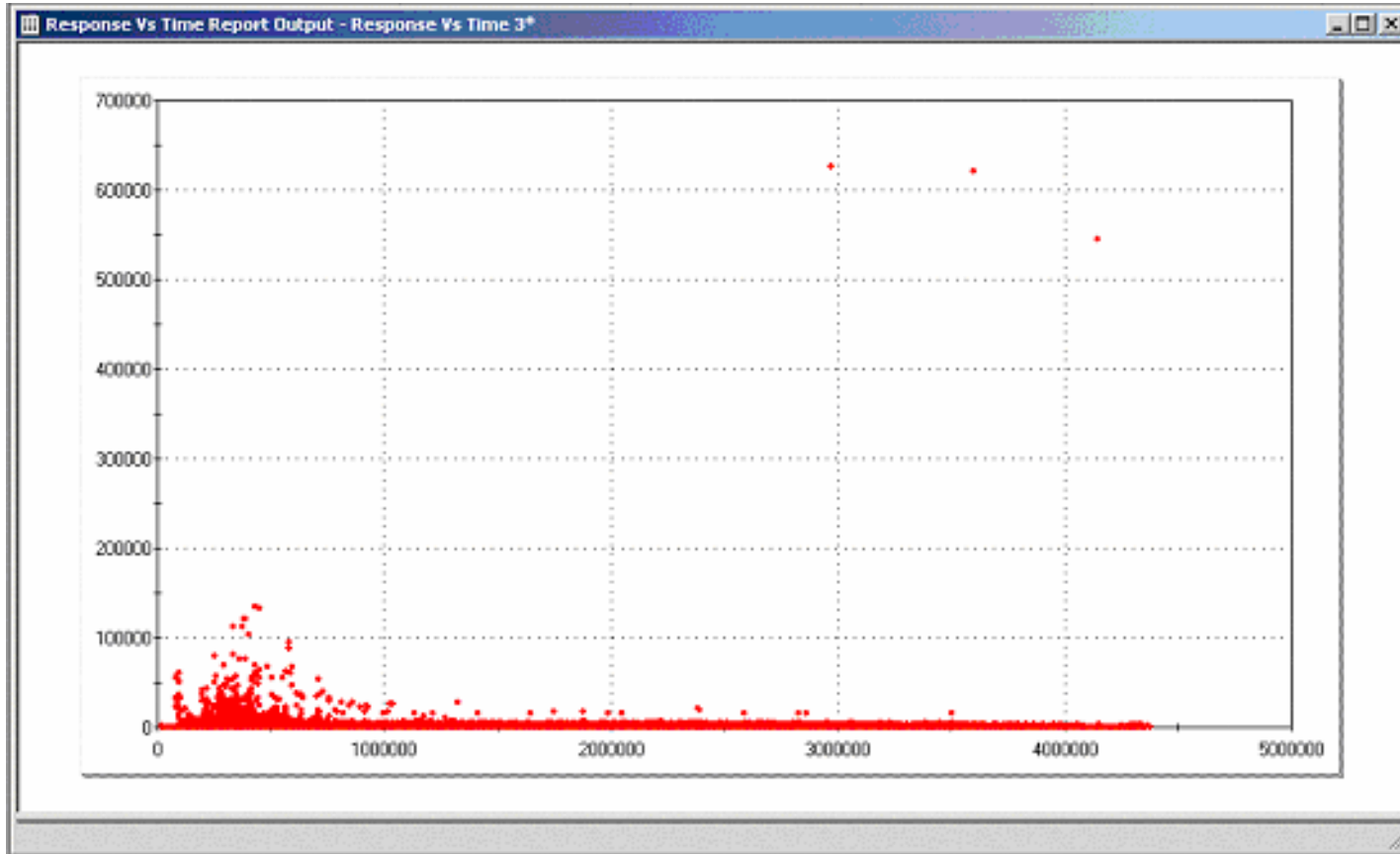
Courtesy of Scott Barber

# Server reboot



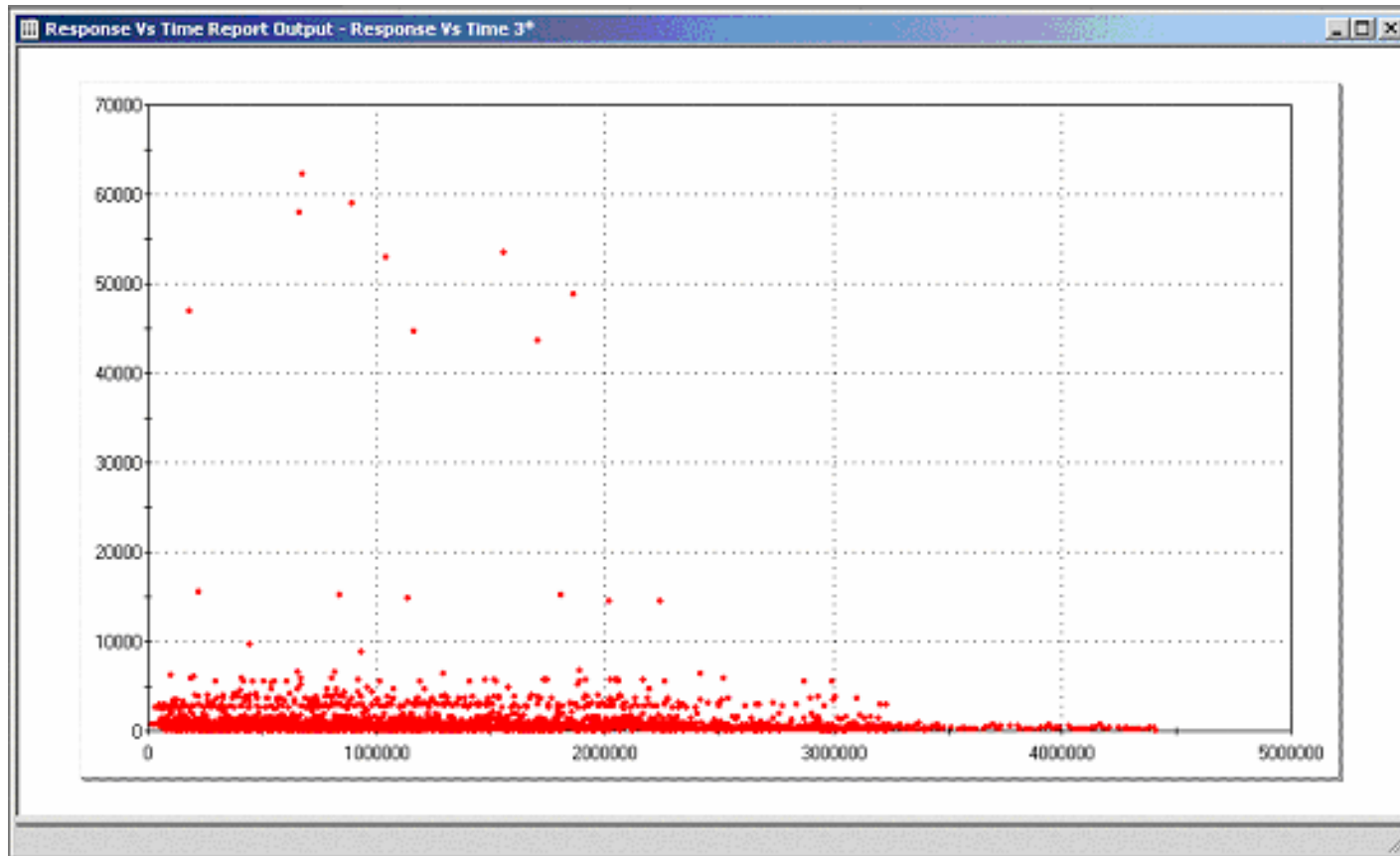
Courtesy of Scott Barber

# JSP compilation



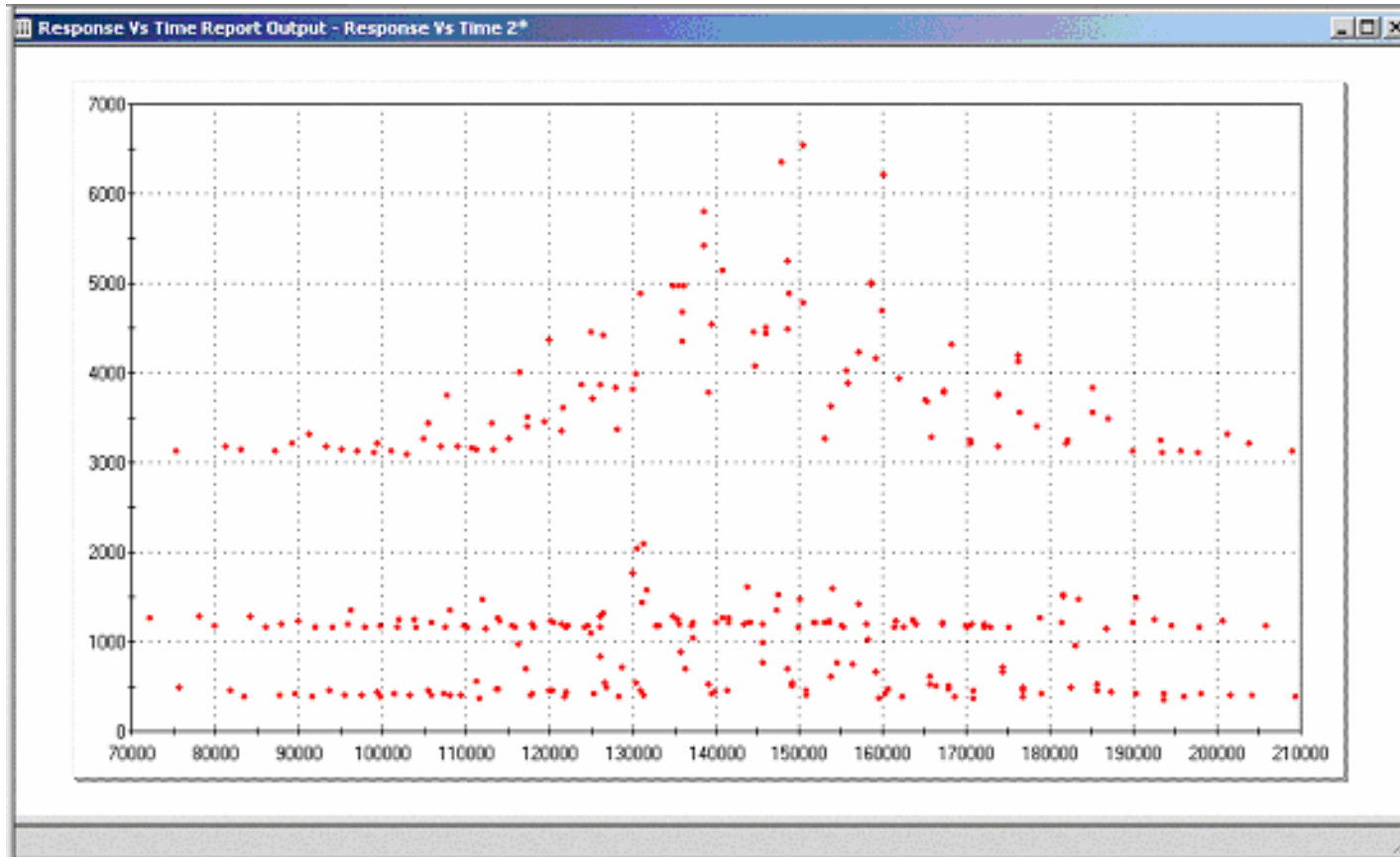
Courtesy of Scott Barber

# Slow database queries



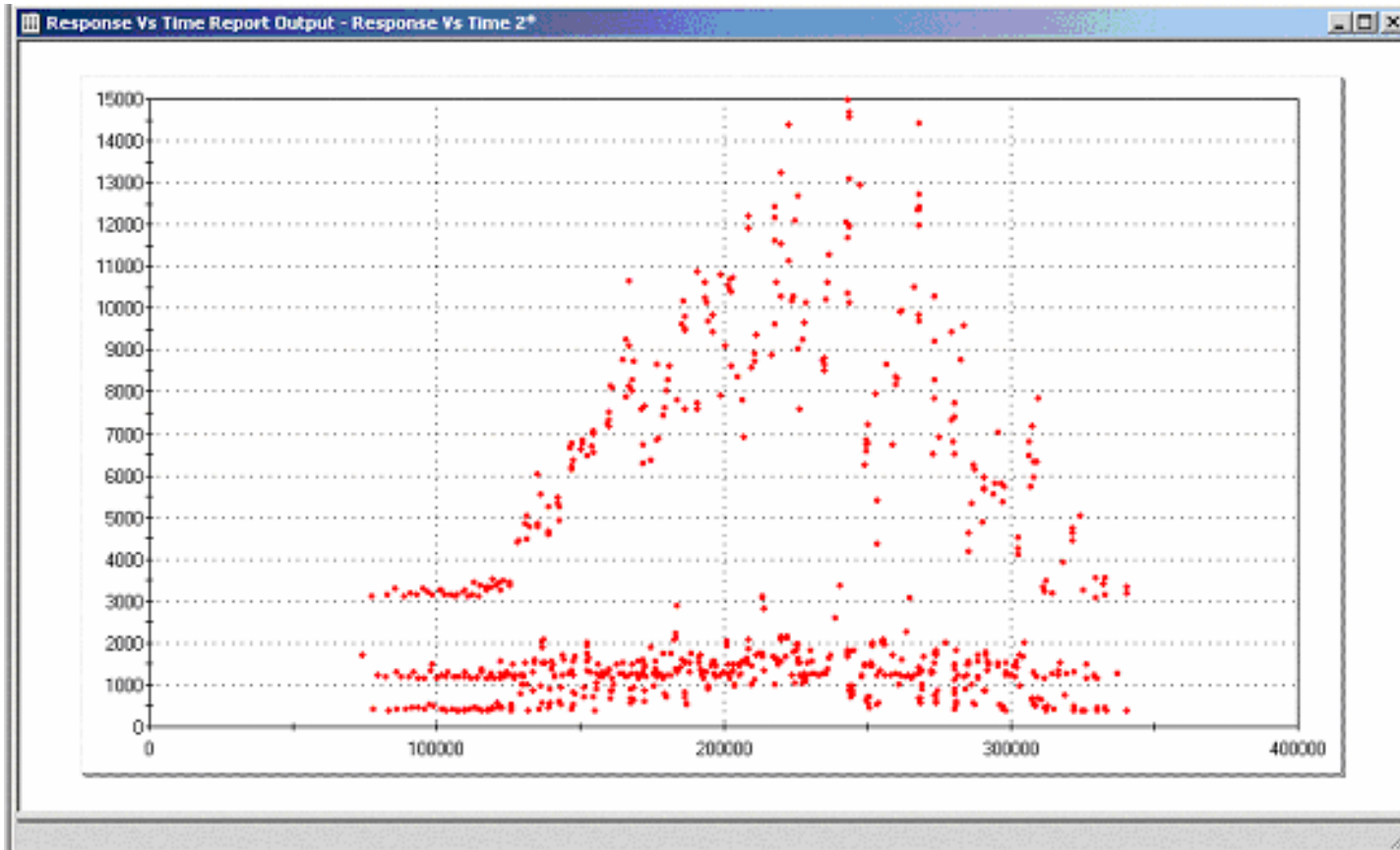
Courtesy of Scott Barber

# Other processes in environment



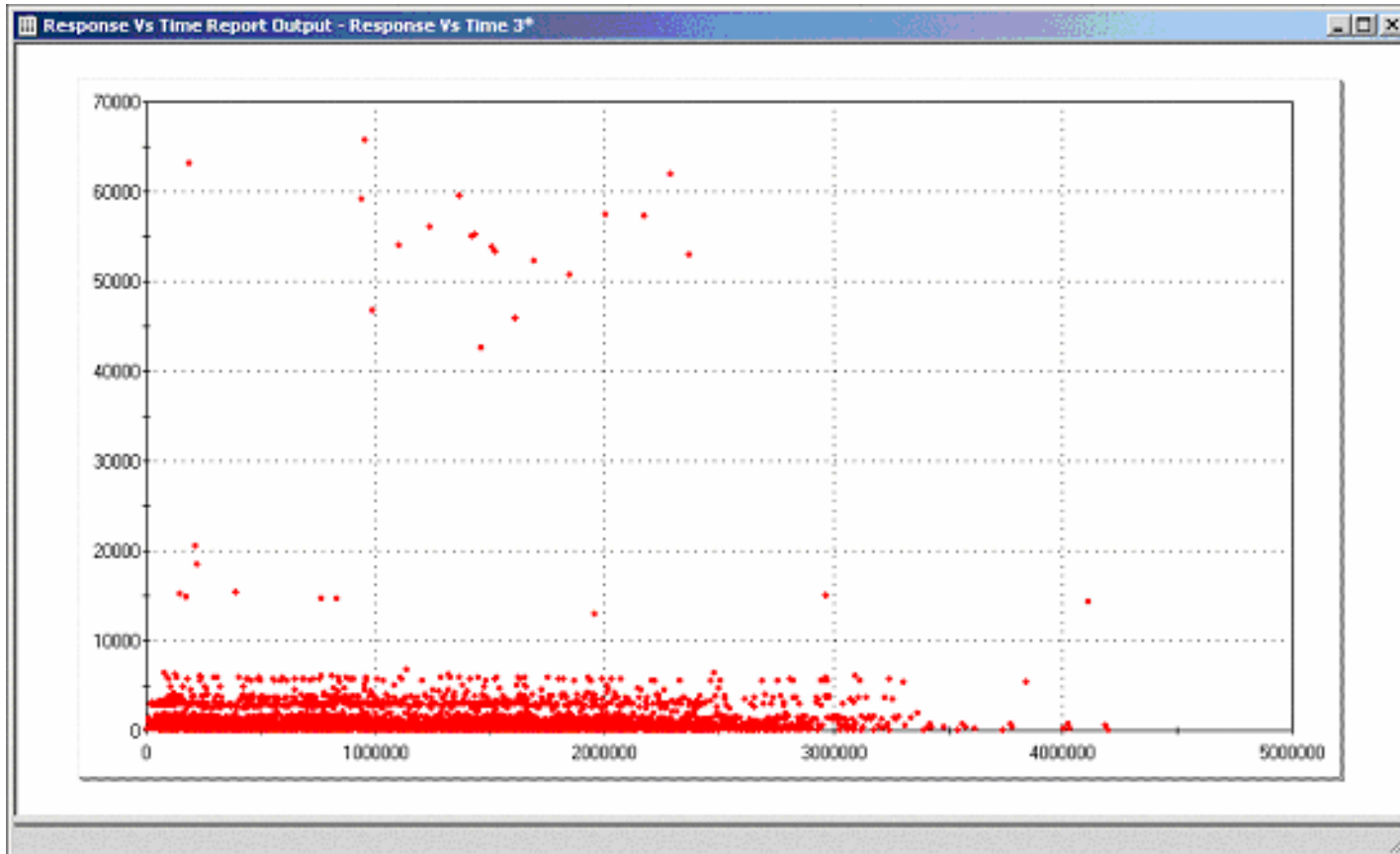
Courtesy of Scott Barber

# “Textbook” slowdown



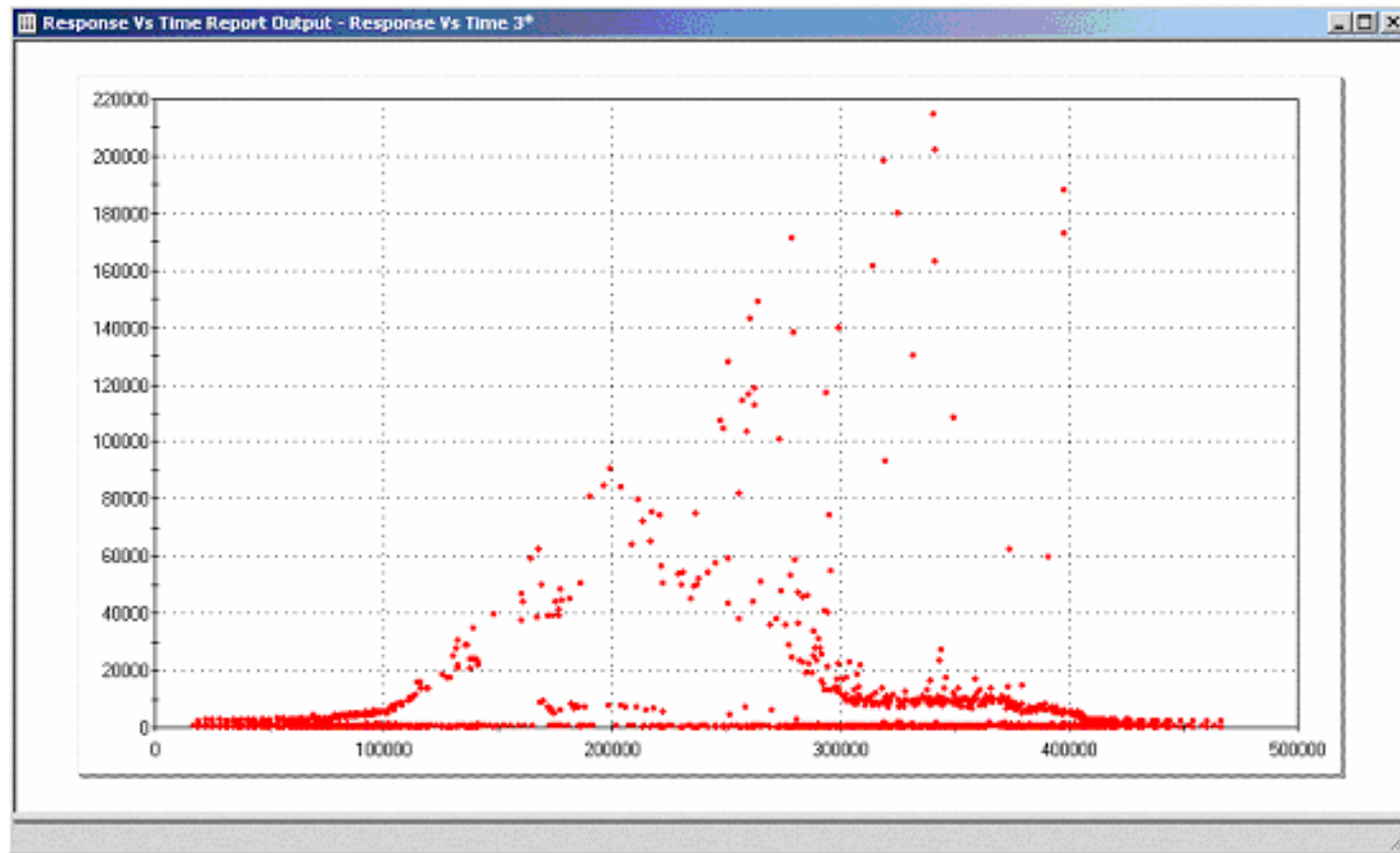
Courtesy of Scott Barber

# Slow report



Courtesy of Scott Barber

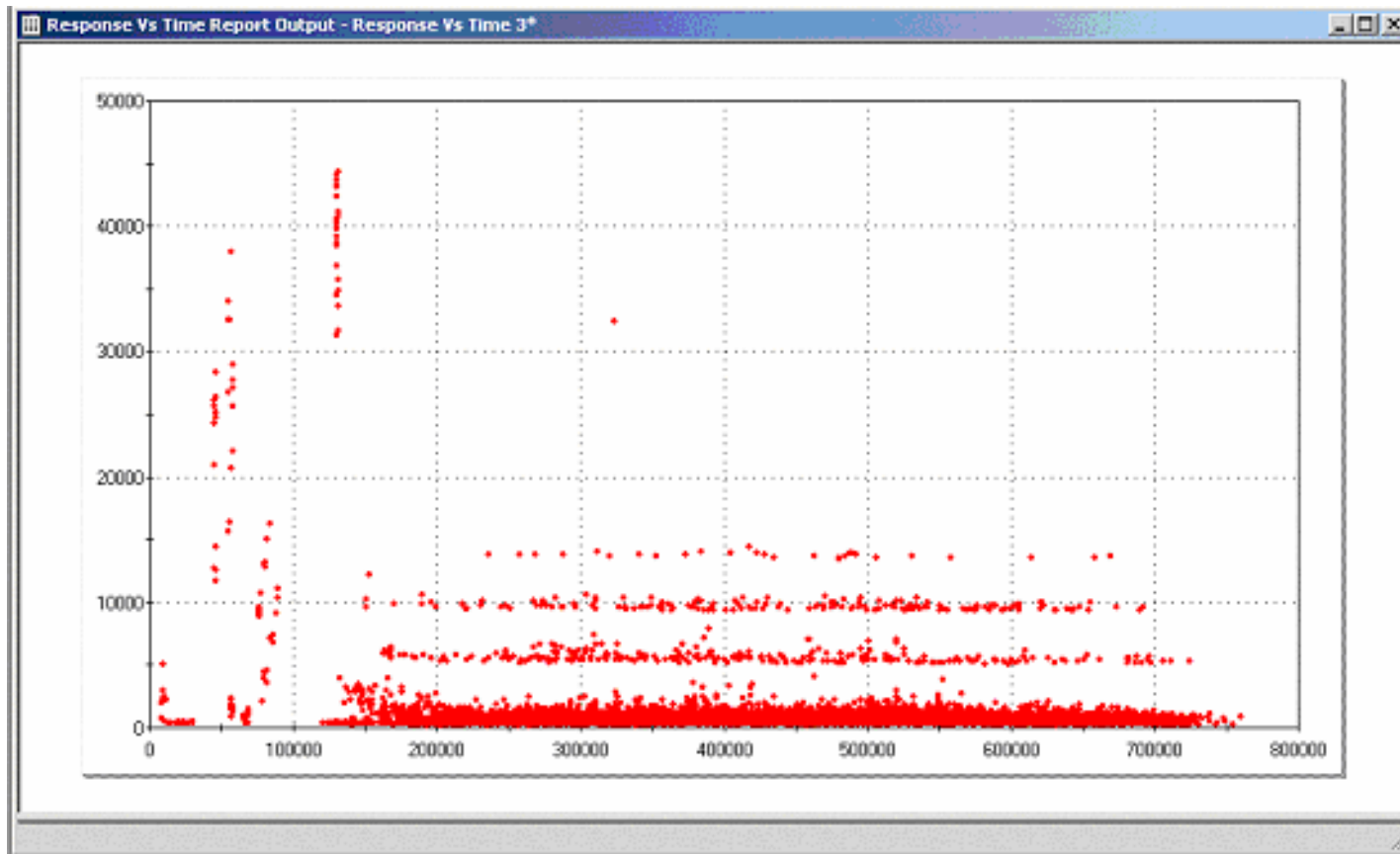
# Dead Server



Courtesy of Scott Barber

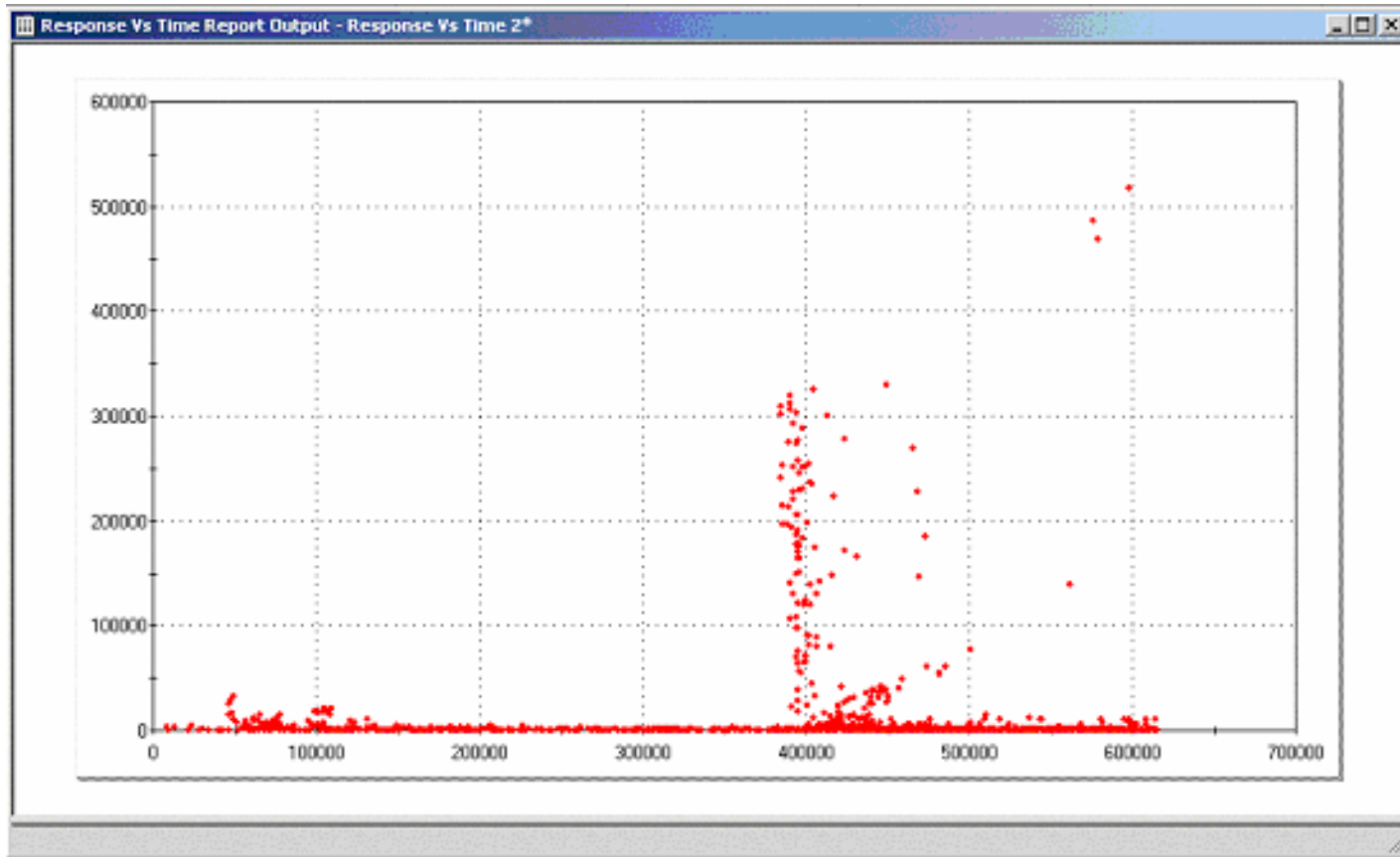


# Proxy issue




Courtesy of Scott Barber

# Load balancing fails



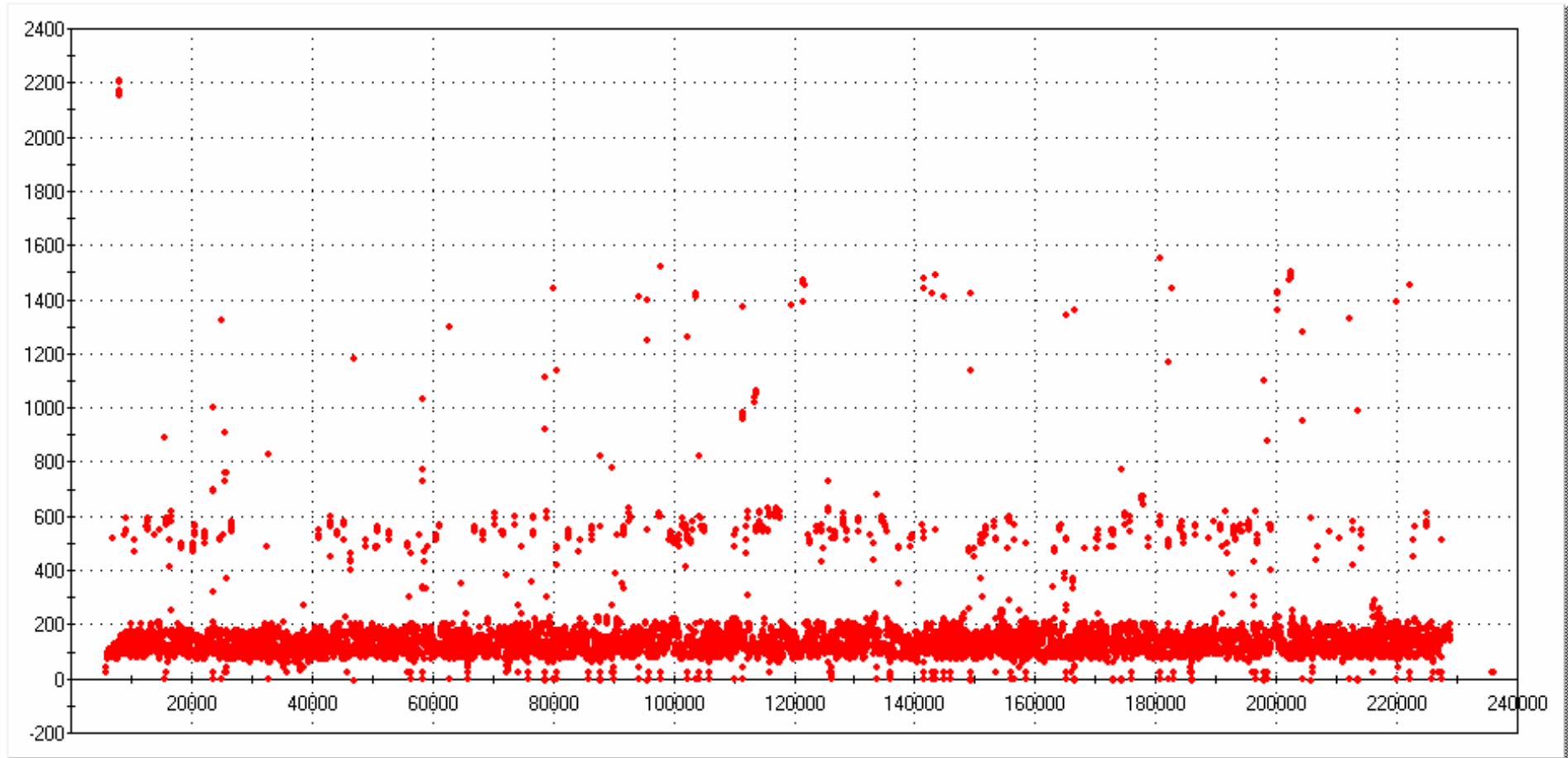
Courtesy of Scott Barber



Samples shared with me by Richard  
Leeke at WOPR3

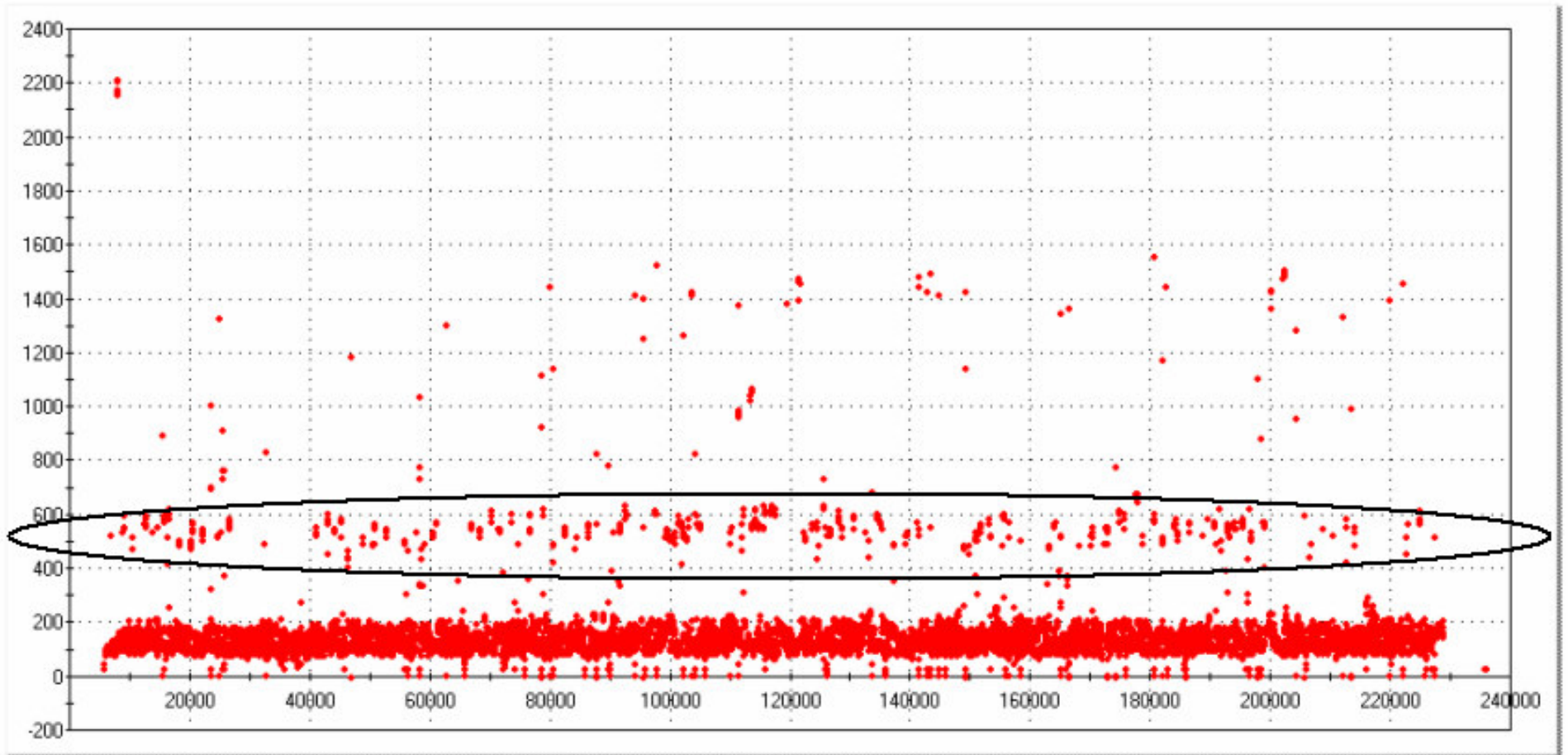
(Workshop on Performance and Reliability)

# TCP packet loss and retries



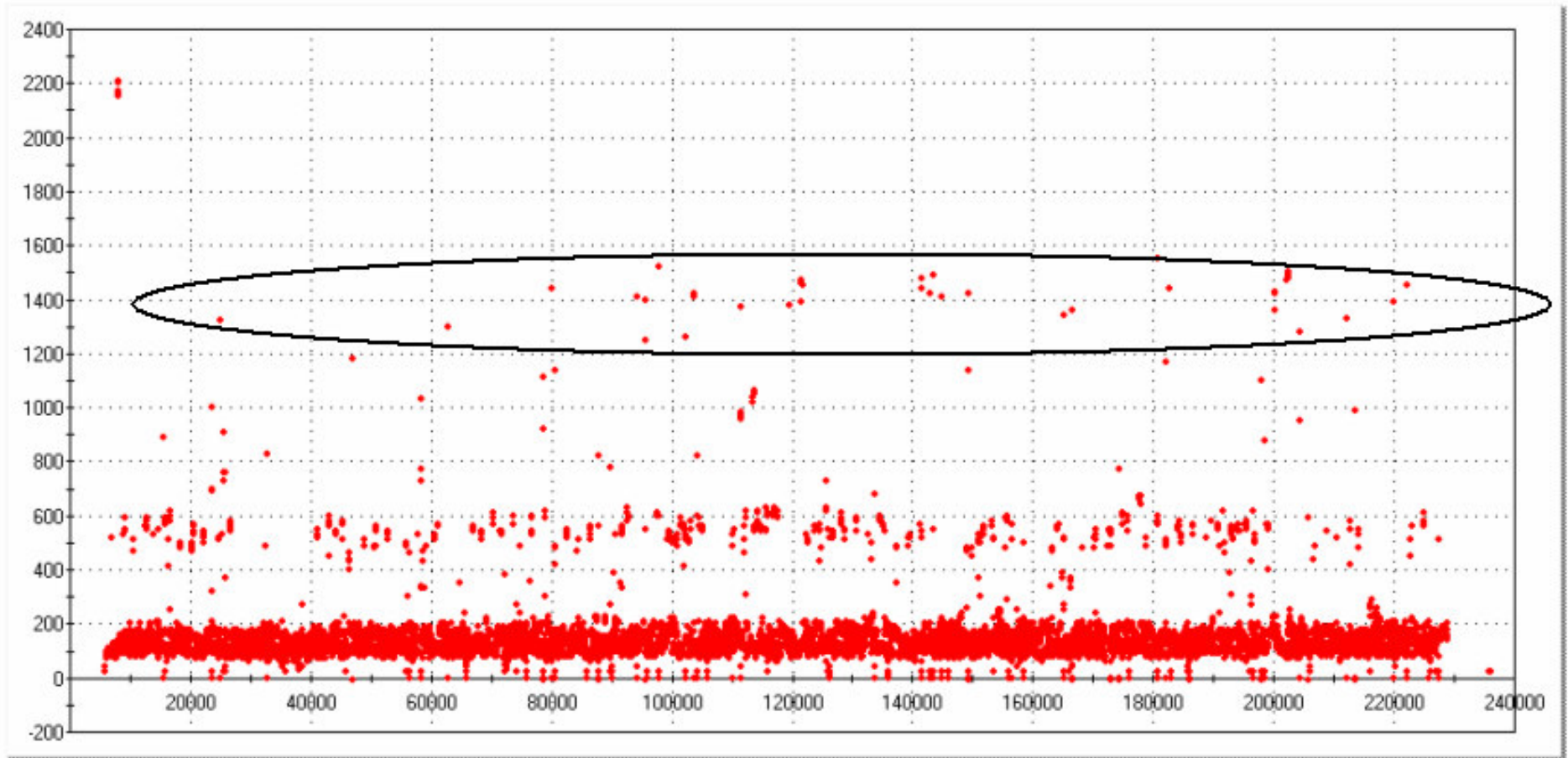
Courtesy of Richard Leeke

# TCP packet loss and retries



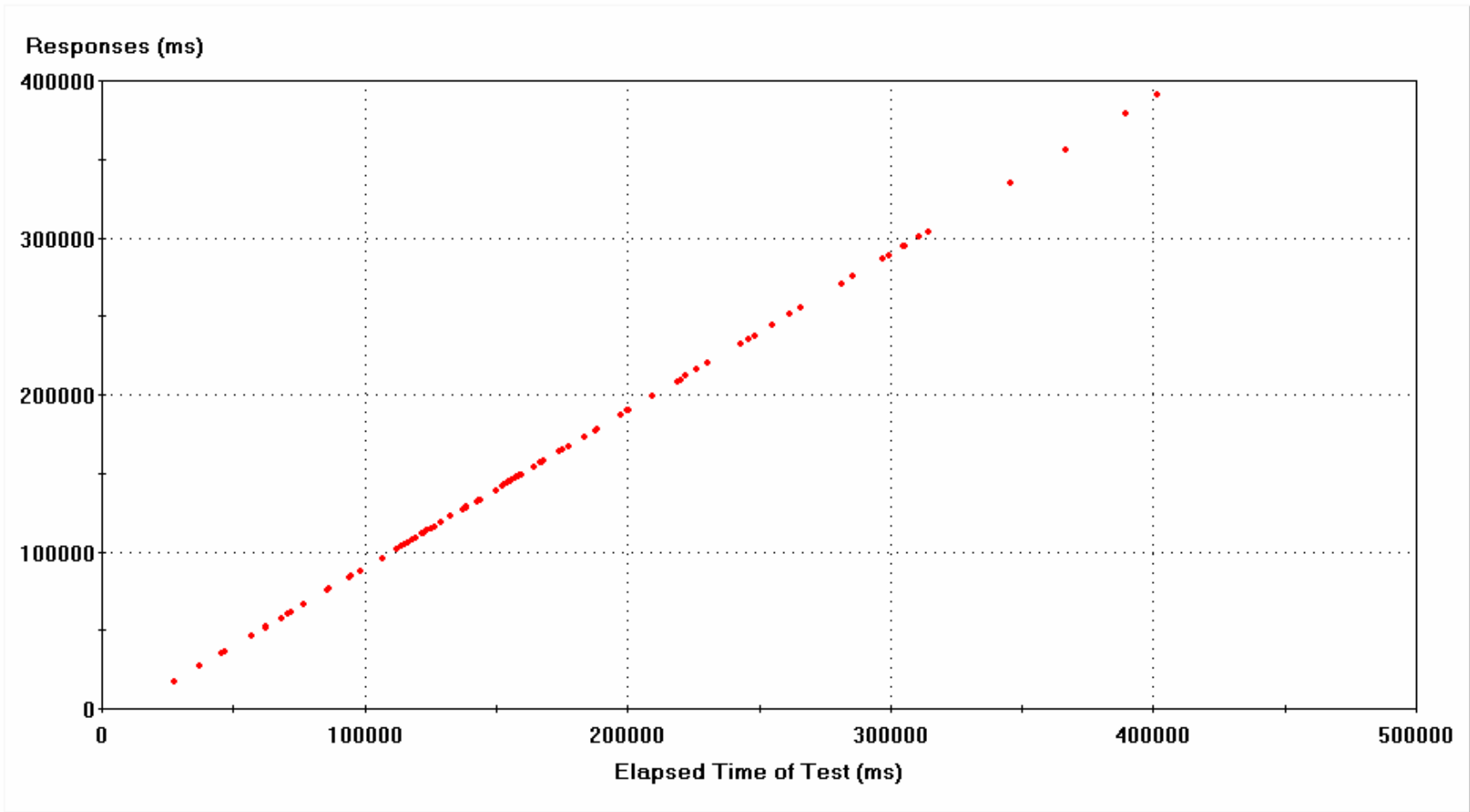
Courtesy of Richard Leeke

# TCP packet loss and retries



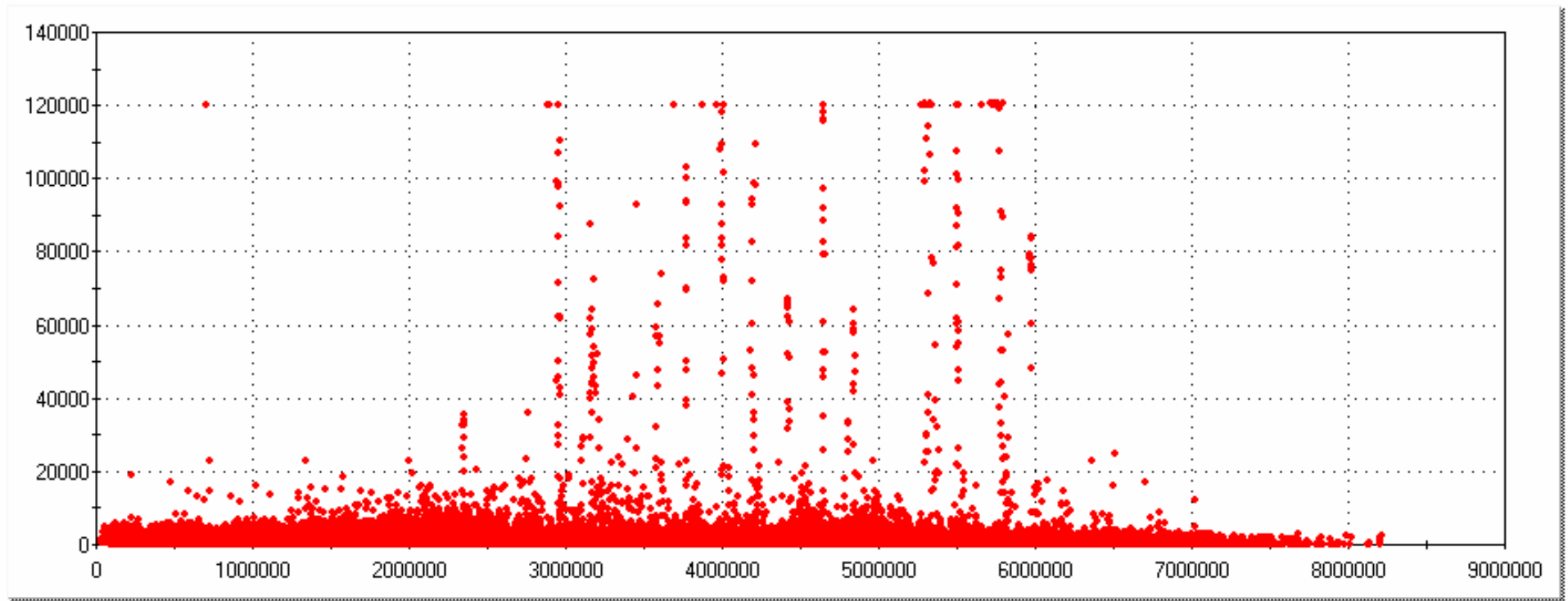
Courtesy of Richard Leeke

# Serialised page



Courtesy of Richard Leeke

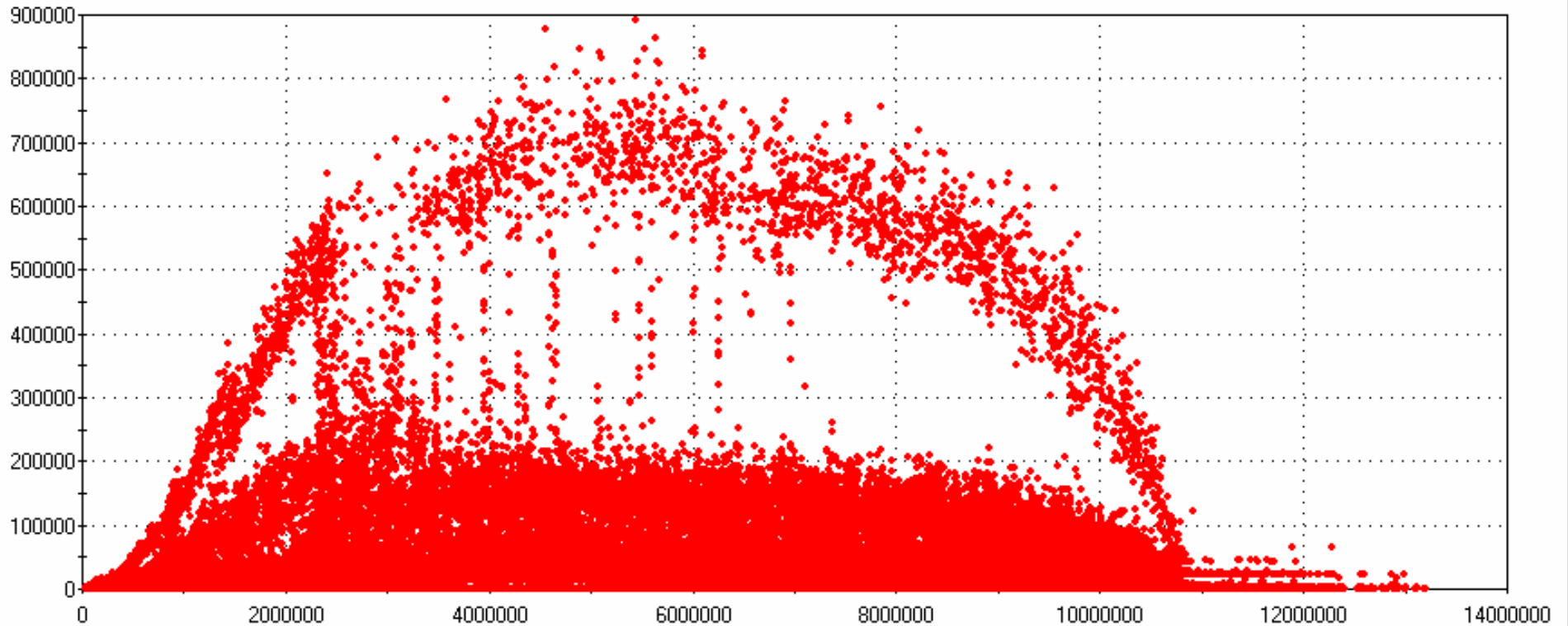
# Blocking issue affecting specific transaction type



Courtesy of Richard Leeke



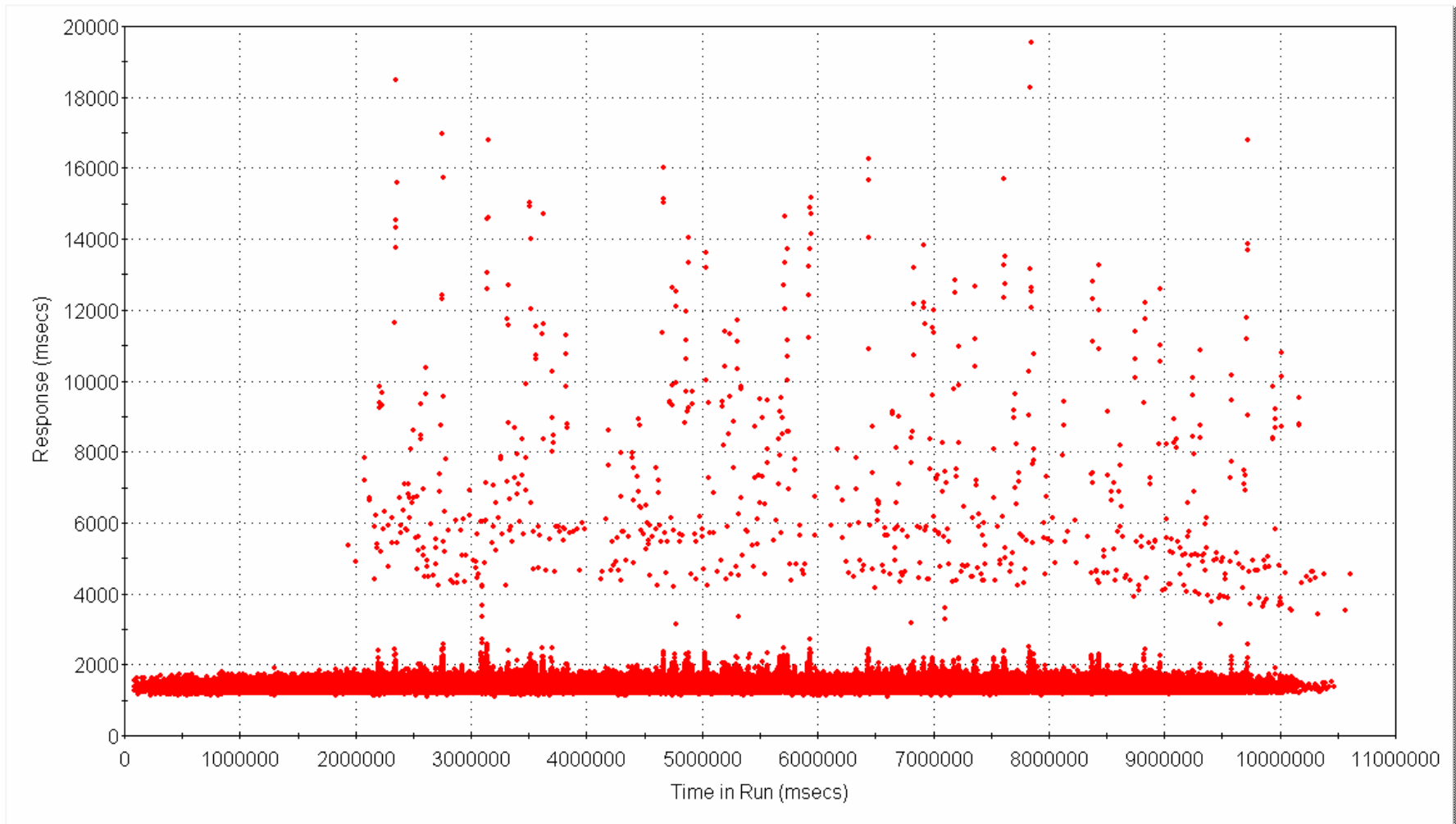
# All sorts of issues



Courtesy of Richard Leeke

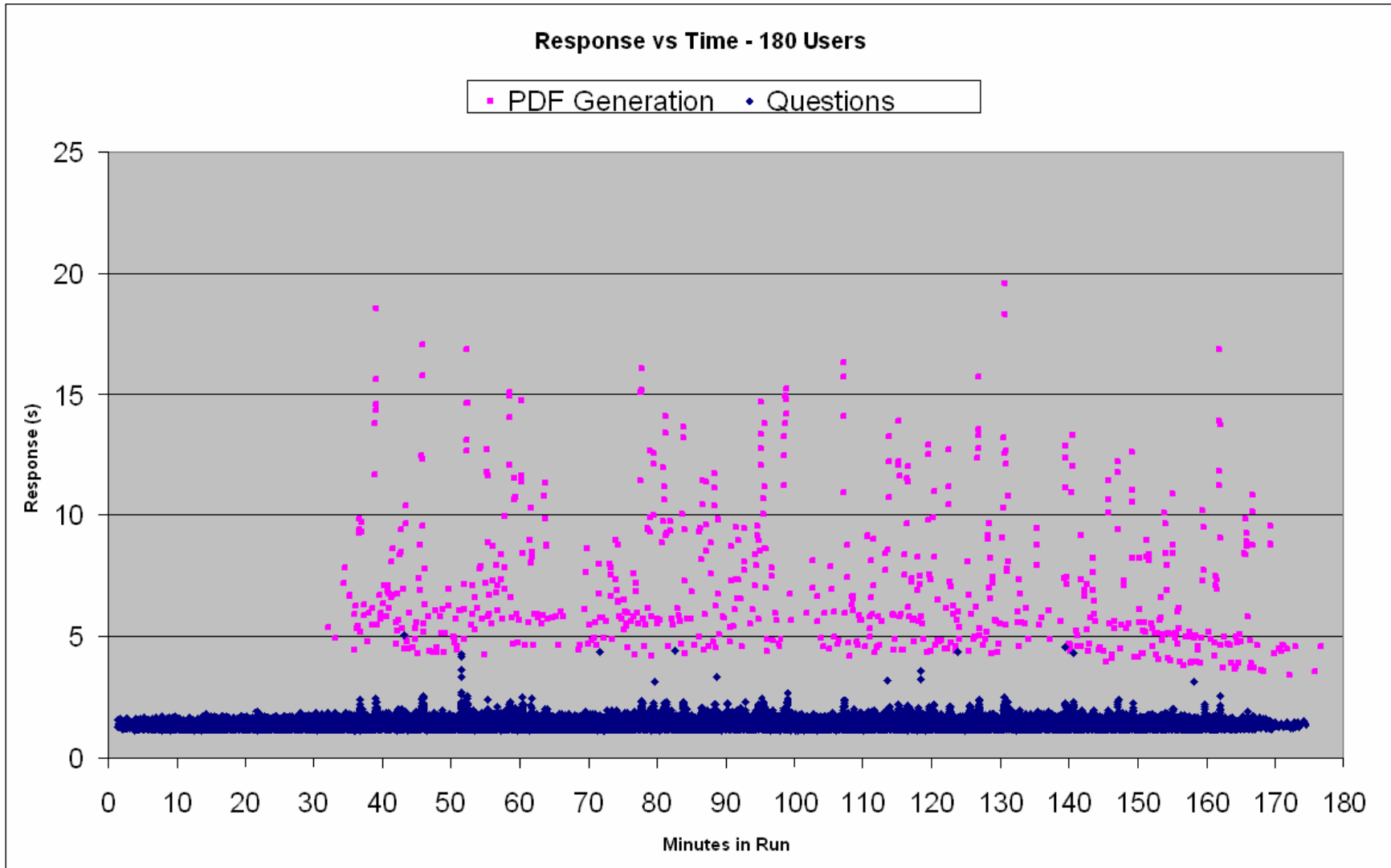
# The benefit of multiple colours

Response vs Time - 180 Users



Courtesy of Richard Leeke

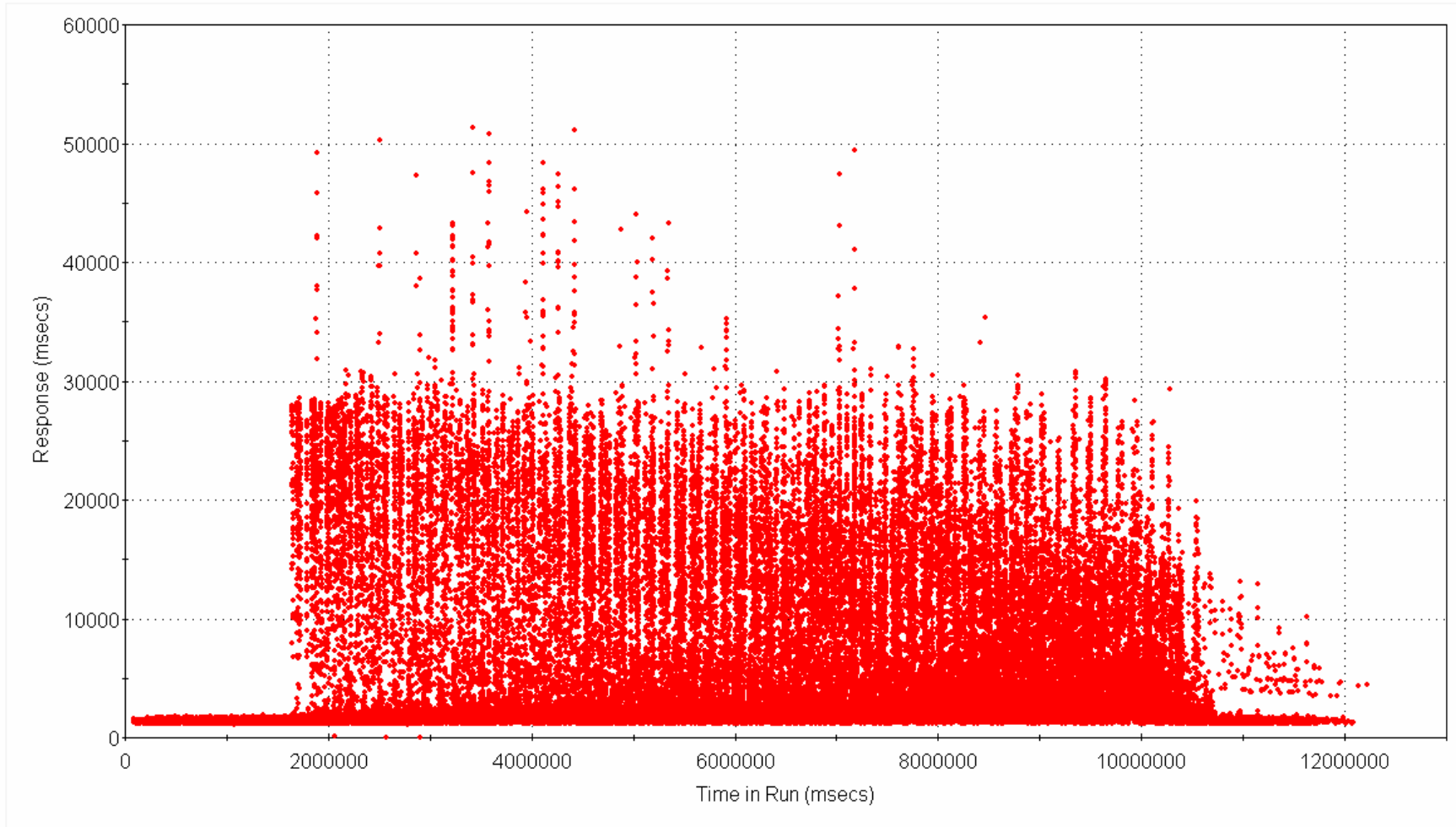
# The benefit of multiple colours



Courtesy of Richard Leeke

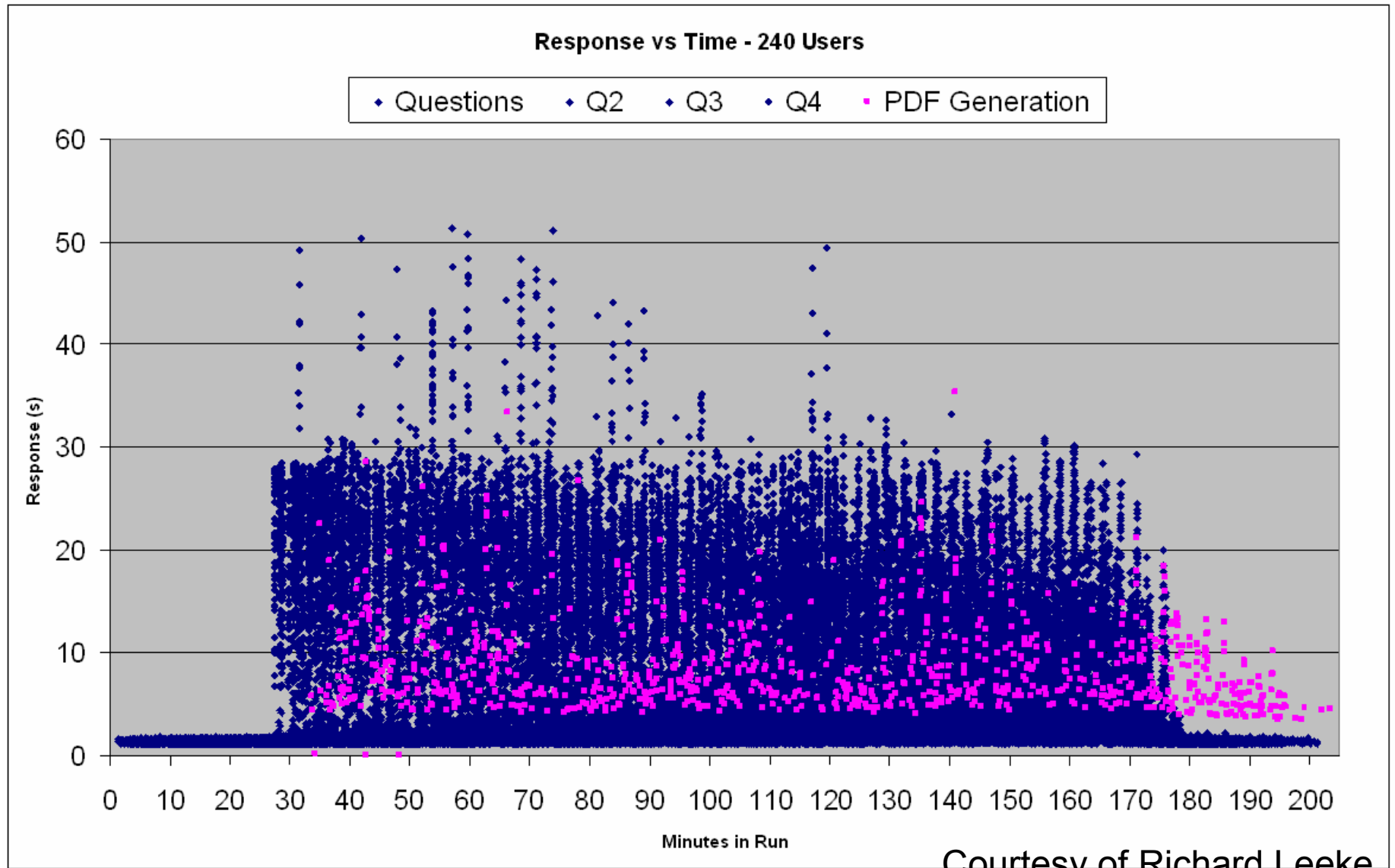
# The benefit of multiple colours

Response vs Time - 240 Users

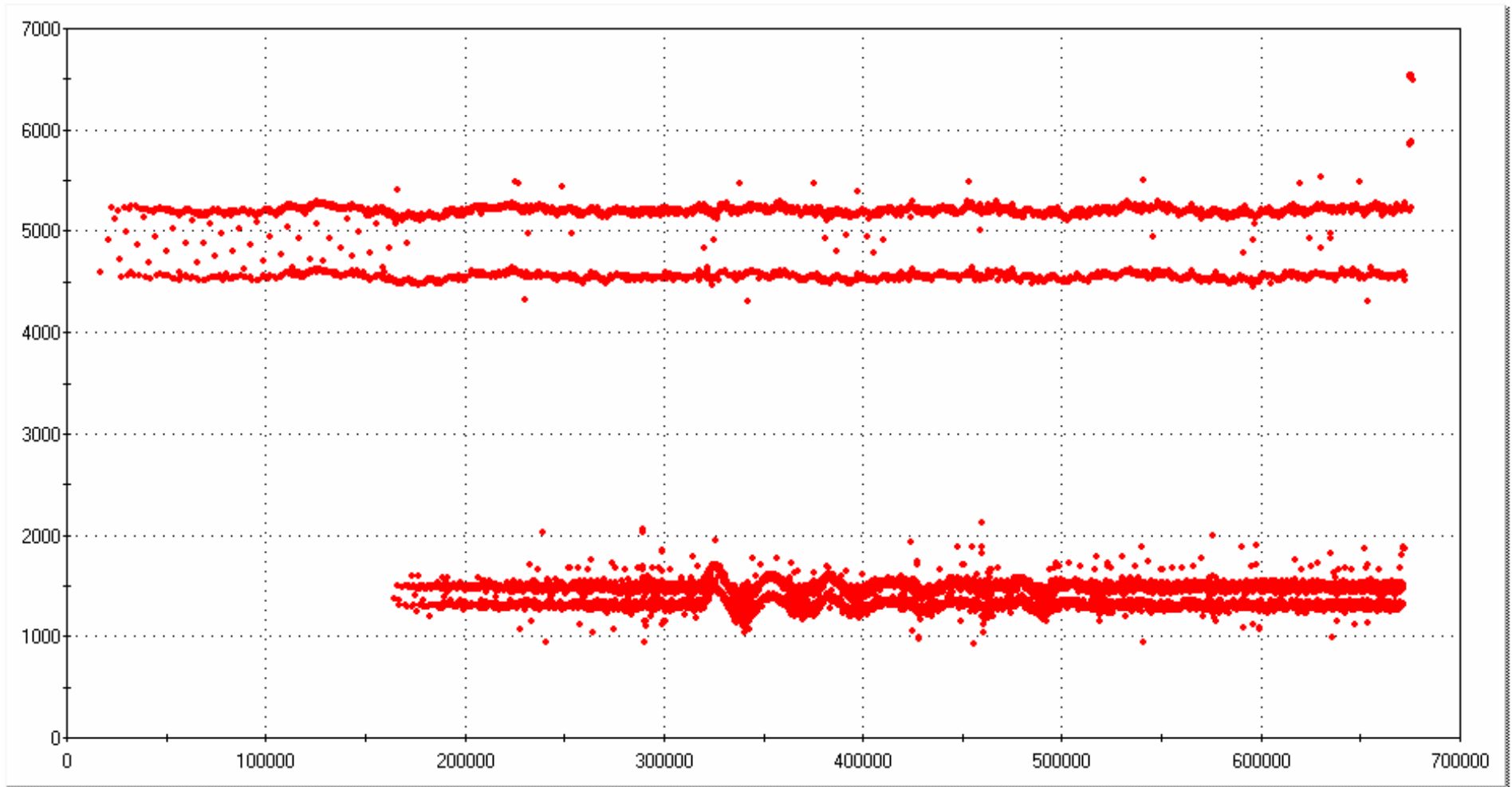


Courtesy of Richard Leeke

# The benefit of multiple colours



# Just for fun...



Courtesy of Richard Leeke