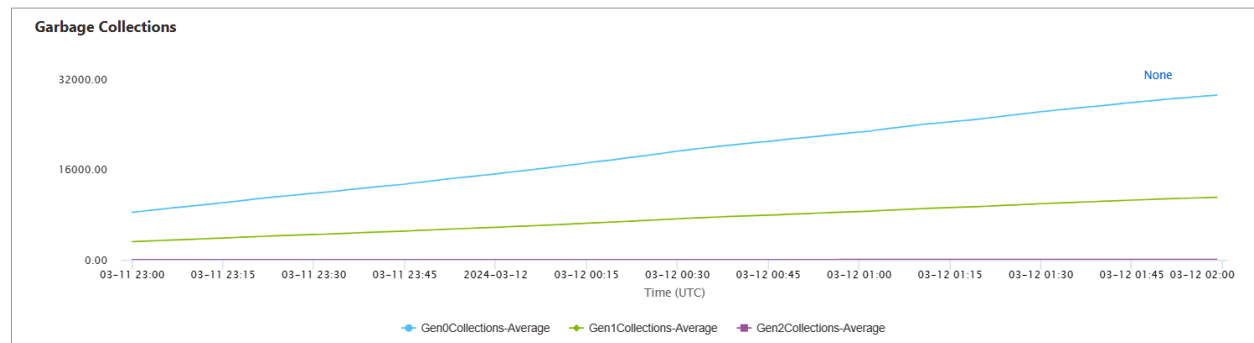Hi Adnan,

I wanted to provide you with the results of our investigation.

When reviewing the profiler trace ProfileWithDassRunningHas90SecondsJITTime_WN0MDWK0000XP_w3wp_9208_20240311-234145.zip

It was noted that the date/time of collection was 03/11/2024 @ 23:41, investigating on our end to see what was taking place on the web app at the time we could see high amounts of

- **Garbage collection**

Note:

- **NET Gen 2 Garbage Collection is a cleanup process in the .NET framework that helps manage memory in your applications. (Application code)**

Example:

- Imagine your room getting cluttered with old stuff. GC is like a magical cleaner that periodically checks your room and removes items you no longer need. It keeps your room tidy and ensures you don't run out of space.

Having a **High Number of .NET Gen 2 Garbage collections will impact severally the app causing slowness,** we recommend making engagement of your developers as identifying the specific cause often requires analyzing application code, monitoring performance metrics, and using profiling tools to pinpoint memory usage patterns and bottlenecks.

We also reviewed the .etl file

- Located the threads with more CPU consumption then group threads with time, provider name task name etc.

| Line #	ThreadId	Time (s)	Provider Name	Task Name	Opcode Name	Id	Process	TypeName (Field 6)	Count	Sum
10479	▷ 4,408									495,939
10480	▼ 15,896									1,553
10481		2.5621736...	Microsoft-Windows-DotNETRuntime	ThreadPool	Dequeue	62	w3wp.exe (9208)		1	
10482		2.5621832...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10483		3.0436715...	Microsoft-Windows-ASPNET	Request	win:Start	2	w3wp.exe (9208)		1	
10484		3.0439812...	Microsoft-Windows-DotNETRuntime	Exception	win:Start	80	w3wp.exe (9208)	35	1	
10485		3.0440123...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10486		3.0440572...	Microsoft-Windows-DotNETRuntime	ExceptionCatch	win:Start	250	w3wp.exe (9208)		1	
10487		3.0440762...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10488		3.0440791...	Microsoft-Windows-DotNETRuntime	ExceptionCatch	win:Stop	251	w3wp.exe (9208)		1	
10489		3.0440961...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10490		3.0440983...	Microsoft-Windows-DotNETRuntime	Exception	win:Stop	256	w3wp.exe (9208)		1	
10491		3.0441156...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10492		3.0441948...	Microsoft-Windows-DotNETRuntime	GarbageCollection	GCAllocationTick	10	w3wp.exe (9208)	System.Object[]	1	
10493		3.0442398...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10494		3.0457645...	Microsoft-Windows-DotNETRuntime	GarbageCollection	GCAllocationTick	10	w3wp.exe (9208)	System.String	1	
10495		3.0458082...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10496		3.0460132...	Microsoft-Windows-DotNETRuntime	GarbageCollection	GCAllocationTick	10	w3wp.exe (9208)	Enumerator[System.Web.Routing.PathSubsegment]	1	
10497		3.0460425...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10498		3.0461847...	Microsoft-Windows-DotNETRuntime	GarbageCollection	GCAllocationTick	10	w3wp.exe (9208)	Enumerator[System.Web.Routing.PathSubsegment]	1	
10499		3.0462206...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10500		3.0464347...	Microsoft-Windows-DotNETRuntime	GarbageCollection	GCAllocationTick	10	w3wp.exe (9208)	System.String[]	1	
10501		3.0464747...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10502		3.0467212...	Microsoft-Windows-DotNETRuntime	GarbageCollection	GCAllocationTick	10	w3wp.exe (9208)	System.String	1	
10503		3.0467509...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10504		3.0469030...	Microsoft-Windows-DotNETRuntime	GarbageCollection	GCAllocationTick	10	w3wp.exe (9208)	System.String	1	
10505		3.0469337...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10506		3.0471220...	Microsoft-Windows-DotNETRuntime	GarbageCollection	GCAllocationTick	10	w3wp.exe (9208)	System.String	1	
10507		3.0471591...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10508		3.0473160...	Microsoft-Windows-DotNETRuntime	GarbageCollection	GCAllocationTick	10	w3wp.exe (9208)	System.String	1	
10509		3.0473445...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10510		3.0475416...	Microsoft-Windows-DotNETRuntime	GarbageCollection	GCAllocationTick	10	w3wp.exe (9208)	System.String	1	
10511		3.0475773...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10512		3.0477866...	Microsoft-Windows-DotNETRuntime	GarbageCollection	GCAllocationTick	10	w3wp.exe (9208)	System.Collections.Generic.Dictionary`2[System.String,System.Object]	1	
10513		3.0478272...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10514		3.0481096...	Microsoft-Windows-DotNETRuntime	GarbageCollection	GCAllocationTick	10	w3wp.exe (9208)	System.String	1	
10515		3.0481486...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	
10516		3.0484053...	Microsoft-Windows-DotNETRuntime	GarbageCollection	GCAllocationTick	10	w3wp.exe (9208)	System.String[]	1	
10517		3.0484428...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	

- The problem here is that the ThreadPool worker thread is spending most of its time in a waiting status:

| Line #	ThreadId	Time (s)	Provider Name	Task Name	Opcode Name	Id	Process	Field 6	Count	Sum
1026		14.338405...	ac1d69f1-bf33-4ca0-9313-bca13873e1dc	<Unknown>		0	w3wp.exe (9208)		1	
1027		14.338404...	d42cf7ef-de92-473e-8b6c-621ea663113a	<Unknown>		0	w3wp.exe (9208)		1	
1028		14.338415...	d42cf7ef-de92-473e-8b6c-621ea663113a	<Unknown>		0	w3wp.exe (9208)		1	
1029		14.338418...	d42cf7ef-de92-473e-8b6c-621ea663113a	<Unknown>		0	w3wp.exe (9208)		1	
1030		14.338419...	d42cf7ef-de92-473e-8b6c-621ea663113a	<Unknown>		0	w3wp.exe (9208)		1	
1031		14.338433...	Microsoft-Windows-HttpService	HTTP_TASK_REQUEST	HTTP_OPCODE_FAST_RESPONSE_LAST	9	w3wp.exe (9208)		1	
1032		14.338441...	Microsoft-Windows-HttpService	HTTP_TASK_REQUEST	HTTP_OPCODE_FAST_RESPONSE	8	w3wp.exe (9208)	2	1	
1033		14.338464...	Microsoft-Windows-HttpService	HTTP_TASK_REQUEST	HTTP_OPCODE_FAST_SEND	12	w3wp.exe (9208)		1	
1034		14.338470...	d42cf7ef-de92-473e-8b6c-621ea663113a	<Unknown>		0	w3wp.exe (9208)		1	
1035		14.338474...	d42cf7ef-de92-473e-8b6c-621ea663113a	<Unknown>		0	w3wp.exe (9208)		1	
1036		14.338493...	06a01367-79d3-4594-8eb3-c721603c4679	<Unknown>		0	w3wp.exe (9208)		1	
1037		14.338653...	Microsoft-Windows-DotNETRuntime	ThreadPoolWorkerThread	Wait	57	w3wp.exe (9208)		1	
1038		16.856135...	Microsoft-Windows-DotNETRuntime	ThreadPoolWorkerThread	Wait	57	w3wp.exe (9208)		1	
1039		18.753503...	Microsoft-Windows-DotNETRuntime	ThreadPoolWorkerThread	Wait	57	w3wp.exe (9208)		1	
1040		19.942439...	Microsoft-Windows-DotNETRuntime	ThreadPoolWorkerThread	Wait	57	w3wp.exe (9208)		1	
1041		20.273116...	Microsoft-Windows-DotNETRuntime	ThreadPoolWorkerThread	Wait	57	w3wp.exe (9208)		1	
1042		20.580960...	System.Diagnostics.Eventing.FrameworkEve...	ThreadPoolDequeueWork		31	w3wp.exe (9208)		1	
1043		20.580964...	System.Threading.Tasks.TplEventSource	TaskStarted		8	w3wp.exe (9208)		1	
1044		20.580973...	System.Threading.Tasks.TplEventSource	TaskCompleted		9	w3wp.exe (9208)		1	
1045		20.580986...	Microsoft-Windows-DotNETRuntime	ThreadPoolWorkerThread	Wait	57	w3wp.exe (9208)		1	
1046		20.618148...	Microsoft-Windows-DotNETRuntime	ThreadPoolWorkerThread	Wait	57	w3wp.exe (9208)		1	
1047		21.322416...	Microsoft-Windows-DotNETRuntime	ThreadPoolWorkerThread	Wait	57	w3wp.exe (9208)		1	
1048		22.846207...	Microsoft-Windows-DotNETRuntime	ThreadPoolWorkerThread	Wait	57	w3wp.exe (9208)		1	
1049		25.811738...	Microsoft-Windows-DotNETRuntime	ThreadPoolWorkerThread	Wait	57	w3wp.exe (9208)		1	
1050		26.460457...	Microsoft-Windows-DotNETRuntime	ThreadPoolWorkerThread	Wait	57	w3wp.exe (9208)		1	
1051		27.194558...	Microsoft-Windows-DotNETRuntime	ThreadPoolWorkerThread	Wait	57	w3wp.exe (9208)		1	
1052		27.642123...	System.Diagnostics.Eventing.FrameworkEve...	ThreadPoolDequeueWork		31	w3wp.exe (9208)		1	
1053		27.642165...	System.Threading.Tasks.TplEventSource	TaskStarted		8	w3wp.exe (9208)		1	
1054		27.642172...	System.Threading.Tasks.TplEventSource	TaskWaitEnd		11	w3wp.exe (9208)		1	
1055		27.642182...	System.Threading.Tasks.TplEventSource	TaskWaitContinuationCompl...		13	w3wp.exe (9208)		1	
1056		27.642185...	System.Threading.Tasks.TplEventSource	TaskCompleted		9	w3wp.exe (9208)		1	
1057		27.642200...	Microsoft-Windows-DotNETRuntime	ThreadPoolWorkerThread	Wait	57	w3wp.exe (9208)		1	
1058		28.354424...	System.Diagnostics.Eventing.FrameworkEve...	ThreadPoolDequeueWork		31	w3wp.exe (9208)		1	
1059		28.354433...	System.Threading.Tasks.TplEventSource	TaskStarted		8	w3wp.exe (9208)		1	
1060		28.355287...	System.Threading.Tasks.TplEventSource	TaskWaitEnd		11	w3wp.exe (9208)		1	
1061		28.355313...	System.Threading.Tasks.TplEventSource	TaskWaitContinuationCompl...		13	w3wp.exe (9208)		1	
1062		28.355318...	System.Threading.Tasks.TplEventSource	TaskCompleted		9	w3wp.exe (9208)		1	
1063		28.355343...	Microsoft-Windows-DotNETRuntime	ThreadPoolWorkerThread	Wait	57	w3wp.exe (9208)		1	
1064		30.052382...	Microsoft-Windows-DotNETRuntime	ThreadPool	Dequeue	62	w3wp.exe (9208)		1	
1065		30.052390...	Microsoft-Windows-DotNETRuntime	CLRStack	CLRStackWalk	82	w3wp.exe (9208)		1	

- Consistently **it seems that the GC is not running it could be because of the Collection.Generic.Dictionary2 which is known to be a not thread safe.** [Dictionary<TKey,TValue> Class (System.Collections.Generic) | Microsoft Learn](#)
- In this case application code needs to be review optimize.
- The first step would be to use concurrent instead, then check the type of GC been run. [Understanding different GC modes with Concurrency Visualizer - Developer Support (microsoft.com)](#)

Looking into the other files they show

- **Thread Pool waiting time as well where there is nothing going on on several threads just waiting on the thread pool:**
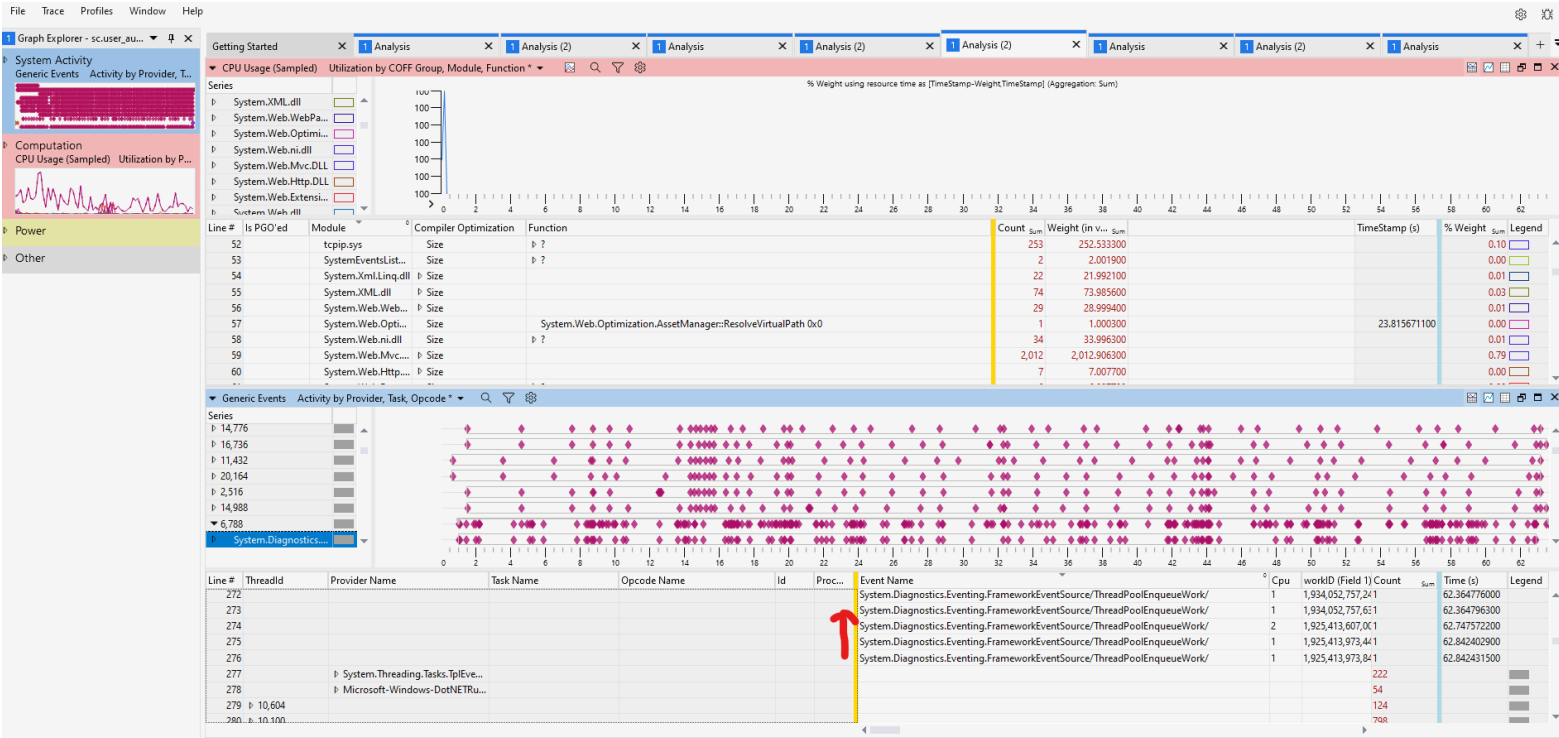
- **While the few ones working are processing messages from Microsoft.Azure.SignalR.Connections.Client.Internal.WebSocketsTransport**
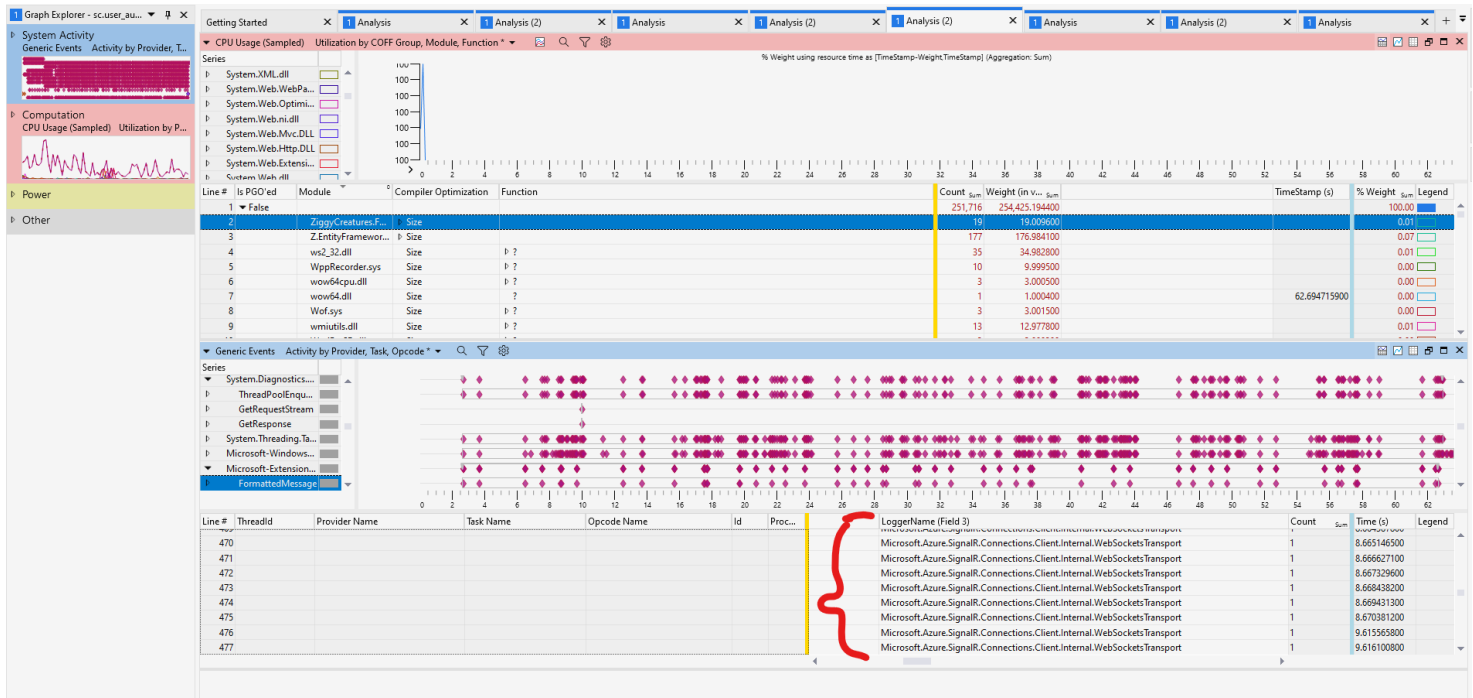
Overall, logs and investigation have proven that that the long time is because the **ThreadPool worker thread, spending most of its time in a waiting status**, **which seems to be caused because of the GC which in turn seems to be the result of the Generic.Dictionary2 usage and not by the JIT time on the profiler as it was originally thought.**

I hope you find this extensive investigation very useful, and it helps clear out any concerns you had on the JIT time, we recommend making engagement of your developers so they can continue the investigation on the required optimization the code needs and help solve the slowness.

If there is anything else we can help you with feel free to let us know, we are always happy to help.

Best Regards.

Support Engineer
Azure | App Services