.NET Memory Management Poster II

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Allocation triggers:
- AllocSmall - running out of budget on Gen 0 during object allocation
- AllocLarge - running out of budget on LOH during large object allocation
- OutOfSpaceLOH - running out of LOH segments space
- Induced - called explicitly from code
- LowMemory - operating system has sent low-memory notification
- Internal - various GC reasons, like AppDomain unload or cleaning up

"Stop-the-world" GC
suspends all threads, may compact

Background GC
with optional Foreground GCs
suspends all threads only for some time, may not compact

GC types:
- N - non-concurrent GC (blocking)
- B - Background GC
- F - Foreground GC (blocking collection of an ephemeral generations during Background GC)
- l - induced (manually triggered) blocking GC
- l - induced non-blocking GC

ETW/LTTng events
- GCStart
- GCThreadSuspend
- GCMark
- GCSweep
- GCStop

Thread suspend/resume
Every managed method may be:
- Fully interruptible - thread running it may be suspended at any time
- Partially interruptible - thread running it may be suspended at specified safe points (mostly, method calls)

Workstation GC
minimize pauses for better interactivity

Workstation Non-concurrent
- No GC threads
- Only "stop-the-world" GC (may compact)

Background Workstation
- Single GC thread
- Gen 0/1 (and sometimes 2) - "stop-the-world" GC (may compact)
- Mostly - Background GC (concurren sweep)

Server GC
maximize resources usage for better throughput

Server Non-concurrent
- By default, N GC threads (N - # of cores)
- Only "stop-the-world" GC (may compact)

Server Non-concurrent
- By default, N GC threads (N - # of cores)
- Mostly - Background GC (concurren sweep)

Legend:
- Working user thread
- Suspending thread
- Working GC thread
- Suspended GC thread

1) Based on .NET Core and 2 CPU cores with 2 user threads, 64-bit Windows
2) Many identifiers (like AllocSmall or % Time in GC) are used as defined in PerfView tool

Version: 1.0.2

Note: LOH allocations not allowed (produces LOH Collection Pause due to Background GC) > 20% Mem report in PerfView.