**Containers - Windows vs Linux + SIMD - Benchmark**

**Base assumptions**:

* We want as few layers(OS) as possible from our App to the bare processor.
* We want our layers(OS) to be as thin as possible.

If we get to achieve these two things, our app will run faster, and it will be easier and faster to create a new instance of our App.

**History**:

* Docker containers has broke in to the world.
* Containers don’t use another OS layer like the VM do, instead it isolates a process in the base OS. (from virtualization to containerization)
* The linux market has taken the lead, of course, because it was easy to isolate a process compared to windows, and because linux has a bigger market share of the servers.
* Windows was trying to chase the trend, and got it’s Hyper-V and Nano-server solutions for containerization.
* Until that day, we all underestimate Windows solution for containers and choosing Linux containers solution as the default and ideal choice.

**What is missing in today’s benchmarks**:

* No benchmarks compare Windows base containers vs Linux base containers.
  + Creation time of the containers.
  + Overall performance.
* No benchmarks compare SIMD technology on both Windows and Linux containers vs usual VMs.

**What I am going to study**:

* Is Windows solution for containers really bad? Maybe it’s even better in some cases. Let’s prove it for once and for all.
* SIMD is a complex technology which uses the OS layer and the Processor layer.
  + Let’s make sure the containers on both Linux and Windows didn’t ruin the great performance of it.
  + Usual benchmark to see if SIMD got even better with containers.

**How it will be done**:

* Using Azure cloud for comparing Windows containers vs Linux containers.
* Using C# benchmarking library. Why?
  + I am very cofitable with C# and .Net.
  + .Net Core is considered to be one of the most performance framework nowadays, thus the OS will be the focus and not the programming language performance.
  + .Net Core supports SIMD technology, which will be part of the benchmark as well.

Yogev Mizrahi, 205707672 - College of Management

References:

* <https://medium.com/jettech/a-short-introduction-to-windows-containers-db5adc0db536>
* <https://www.phoronix.com/scan.php?page=article&item=docker-summer-2018&num=4>