Justin **Cheung**

Senior Software Engineer

Redmond, WA, USA

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Technical Skills

Programming	Bash, C/C++, C#, Java, Kusto Query Language (KQL), PowerShell, Python
Platforms	Linux, Windows
Tools/Frameworks	Git, Jenkins, LLVM, Selenium, Visual Studio, WinDbg, Windows Performance Analyzer

Experience

Microsoft Corporation — *Redmond, WA, USA*

Senior Software Engineer - Hyper-V Virtualization Infrastructure Services Team — *Jan. 2022 - Present*

- Implemented Hyper-V virtualization stack support for Virtualization Infrastructure Driver (VID.sys) runtime reload during an Ultralite Virtual Machine Preserving Host Update (VM-PHU) with Handle Brokering, which enables VID.sys to be runtime reloaded during a VM-PHU without requiring a host reboot or storage/network I/O drain, which are known bottlenecks.
- Contributed to the design and implementation of Virtual Processor (VP) Auto Suspend for VM-PHU, which defers VP suspend to the Windows Hypervisor until the arrival of root partition intercepts, thereby minimizing VM compute blackout during VM-PHU and enabling Hyper-V virtualization stack components to be serviced on the host while VMs are still running.

Software Engineer II - Storage Spaces Dev Team — *Sep. 2015 - Jan. 2022*

- Optimized Storage Spaces Repair (i.e., RAID resilvering) by enhancing Storage Spaces metadata to track stale logical data copies at stripe granularity (i.e., 256 KiB) vs. extent granularity (i.e., 256 MiB) previously, which reduced the run time of Storage Spaces Repair from hours to minutes.
- Implemented Storage Spaces support for configuring, deploying, and managing Storage Spaces with node-mirrored mirror and node-mirrored parity multilevel resiliency settings on 2-node Storage Spaces Direct (S2D) Failover Clusters, which enables Storage Spaces on 2-node S2D Failover Clusters to tolerate 1 node + 1 drive failures vs. 1 node failure previously.
- Designed and implemented an extra-resilient cache for staging writes to Storage Space ranges backed by a suboptimal number of logical copies to enable write forward progress without compromising on redundancy and risking data loss.

IBM Canada Ltd. — *Markham, ON, Canada*

Compiler Optimization Developer (Intern) — *Sep. 2014 - Dec. 2014*

- Assisted with the implementation of a translator for translating LLVM IR to the intermediate representation used by IBM's XL C/C++/Fortran compiler.
- Expanded test coverage for IBM's LLVM IR translator by writing a program in C/C++ to spoof IBM's XL C/C++/Fortran compiler test drivers so that its test buckets could be reused for validating IBM's LLVM IR translator.

Citigroup Inc. — *Mississauga, ON, Canada*

Operations Technology Developer (Intern) — *Sep. 2013 - Dec. 2013*

- Automated a bookkeeping workflow at Citigroup by writing a program in Java to periodically scrape financial data from an internal website using Selenium and format the data to Excel, which saved a bookkeeper over an hour per day otherwise spent doing manual data entry.
- Implemented automated tests for Citigroup's Global Stock Record (GSR) web frontend using Java and Selenium to reduce reliance on manual testing.

Nav Canada — *Ottawa, ON, Canada*

System Software Developer (Intern) — *Apr. 2012 - Aug. 2012*

- Ported Nav Canada's air traffic control software build distribution tool from HP-UX to Red Hat Enterprise Linux with a Java ICEFaces web frontend, which simplified the air traffic control software build distribution workflow by automating steps that were previously performed manually.

Patents

Extra-resilient cache for resilient storage array

Taylor Alan Hope, Vinod R. Shankar, Justin Sing Tong Cheung — *Jun. 28, 2022*

- Application Number: US 17/100,557. Patent number: US 11372557.

Multilevel Resiliency

Karan Mehra, Justin Sing Tong Cheung, Vinod R. Shankar, Grigory Borisovich Lyakhovitskiy — *Oct. 20, 2020*

- Application Number: US 16/389,605. Patent number: US 10809940.

Education

University of Waterloo — *Waterloo, ON, Canada*

BASc in Computer Engineering — *Sep. 2010 - Apr. 2015*