



## An Interview With William Carter

IT transformation will increasingly focus attention on infrastructure and operations as businesses look to capitalize on innovations in both hardware and software-defined models. The age of the software-defined infrastructure is becoming a reality as everything from network to security is virtualized and delivered as a service. In order to explore this issue, as well as gaining insights into the state of the data center and the future of technology, TSO Logic sat down with William Carter, Senior Data Center Architect with Intel and member of the Incubation Committee at the Open Compute Project Foundation, to explore the issues surrounding transformation, visibility and innovation in the data center.

## What is the biggest challenge facing IT today?

A: You can answer that question differently for different organizations, and different segments. If you're a hyperscale-size Cloud service provider, you have different challenges than an enterprise that is trying to offer private Cloud services for the first time. Ultimately, cost per VM or cost per user, and the total cost of ownership drives these strategic directions and is forcing organizations to review everything from transformation of their existing cloud to public Cloud options to off-premise options.

Organizations that have not pushed their infrastructure forward are facing cost issues, those organizations that have not evolved their orchestration of their Cloud, have not established strategic metrics for VM density and utilization, and performance, are being left behind.

These organizations now have a gap in their overhead rates versus what they can buy from the outside, and I believe that gap can be substantial. One such problem is the data center itself, the physical facility, even if they put the most efficient IT equipment in there they still have a facility that is old and inefficient and there is little they can do; this makes optimization far more challenging.

### About William Carter

William Carter serves as the Senior Data Center Architect with Intel, working to solve pain points of data center operators worldwide. With over 30 years of expertise and leadership, Carter is widely regarded as an expert in the areas of Data Center Design, IT Utilization and Optimization and critical areas of efficiency including total cost of ownership, energy efficiency and power and thermal assessment. In 2014, Carter was elected to join the Open Compute Project Foundation's Incubation Committee, and serves as the lead for the Telco Workgroup.

## How has the Cloud conversation evolved in the past several years?

A: If you go back ten years ago, what I saw is organizations focusing on their facility because it was old and it was inefficient. We had PUEs of 2.0 and really low power densities. We had old equipment that we were keeping around and keeping online.

Then we looked at the age of the IT equipment and realized the advantages of faster refresh and using newer, more efficient, and higher performance servers. If servers are six to eight years old and the business is growing at 30, 40, or 50 percent per year, you are not utilizing your capital investment that well. Modernization also allowed organizations to improve application and VM density, decreasing footprint while increasing performance and output.

In the last few years, we are starting to see that the facilities and hardware are under control. Now it is time to look at software and software licensing strategies. The facility

(PUE) and IT refresh was relatively easy to fix, and we're left with a more challenging problem today. Now the big questions are: "How do I adopt an open source strategy? What's the trade off between purchasing the support as a bundled product or shrink-wrapped product, or do I invest in the resources and the skill sets to manage my own OS image?"

As much as the industry has embraced the notion of open source software there is still a level of maturity that is hard to adopt. Progressive organizations are addressing software licensing, develop that expertise, and ultimately, optimize and modify the software for the applications they run. This will ultimately drive the highest efficiency from the CAPEX investment in IT equipment.

## How has the drive for transformation impacted the dynamic between the C-Suite and the Data Center?

A: My answer comes from my roots as an engineer and my experience in working with the people that have their feet on the ground in the data center. Often, there is a disconnect between the CIO that owns the data center, and the data center operators that are actually running the data center.

The guys that have their feet on the ground are busy fighting fires or trying to keep their equipment up. They are all trying to figure out, "How do I grow the business by 20 percent when I only have 15 percent of capacity left?" They're blocking and tackling – they do not have time to be strategic.

Then you have the CIO who owns the strategic plan and responsive to the business partners, but does not have to deal with the day-to-day grind of keeping things running. The business units have a very simple approach for IT growth, "I have 100 servers running this application. Can't I just grow it to 120, or 140?"

The business units are calling the CIO and simply asking, "Can't I just go order more equipment right now? Why can't we just move forward?" Meanwhile, IT is looking at this and saying, "I can't afford to just add 20 to 40 percent more equipment every year! I have all these other issues, we need the space and the power, licensing and the resources to manage that increase!" And they don't have the budget to do that.

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Whether the business is lacking visibility or the business lacks an understanding of the true cost of running the data center – they don't have the metrics or the variables that drive that cost.

## When the goal is modernization or transformation, what level of visibility will be required to continue advancement?

A: It is rare to run across someone in the data center that knows about the workloads that are running on a machine, which is frustrating because that means they are installing equipment, in many cases investing in building out a Cloud environment, and they don't understand whether it will be effective. They are making big investments in hardware and software but then they look at utilization and realize the equipment has not been optimized for the specific workloads. So more equipment is needed even as they're trying to figure out why performance is so poor.

If you can't characterize it, you can't optimize it. You have to have the tools and the time to optimize. When teams are getting pulled in so many different directions, they simply do not have the time. But this is where the orchestration software and intelligence comes into play. There's more telemetry information coming out of servers and other data center systems today than there was yesterday. We're able to look at power and break it down by VMs, measure and predict, if not report exactly, at a power per VM, or CPU utilization per VM level. As that information becomes more prevalent, the orchestrators will be able to use that information and intelligently place work, move work, and increase utilization.

Each organization needs to look at their systems through a finance lens and really start to help drive (or at least steer) decisions. There are so many different variables that can drive these decisions around investment and modernization, and transformation. The types of customers you serve, the types of applications, the resiliency demands, the business continuity demands, and even regulatory governance will drive decisions.

Not only do you need to have that capability to gather the right insights and intelligence for the business, you also must understand the impact. This demands intelligence that knows what happens when you start turning those knobs. What happens when you turn the knobs from zero to 100 percent? How does the facility, how does the IT organization, and how do the costs change when you make those big transformations?

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## What's next in this evolution of transformation?

A: I believe Software Defined Infrastructure (SDI) is going to be real. The industry has been looking at open sourced software and orchestration for years and it is now ready for mainstream. There is a lot of momentum around bridging the hardware with the operating systems and the Cloud utilities to make this SDI vision real. At Intel, for example, we have our Rack-Scale Architecture that aligns quite nicely with SDI and accelerates the adoption of SDI.

## Any final words of advice?

A: I see big opportunities ahead with the telemetry information coming out of the hardware. The new telemetry data, performance metrics, and more granular control of the hardware exposed and enabled by open API's will bring about much better IT efficiency and energy efficient data center operations. When the cloud orchestration software can take full advantage of the new telemetry and control, I expect to see much better placement of workloads, and amazing breakthroughs in total cost and resource efficiency. The private cloud will be very cost effective.

# Conclusion:

## Getting To The Critical Insights

One of the greatest challenges in reaching a state of holistic intelligence from telemetry is the sheer challenge executives face when attempting to aggregate and assimilate the mountain of data flooding in across various silos. From Cloud to facility, the disparate data sources are more often collected and analyzed within their individual silos, yet far more difficult to connect. This partial view fails to provide a clear and comprehensive picture of business performance, and cannot deliver real action that impacts the business.

This is why the TSO Logic platform was developed – out of the sheer frustration of requiring intelligence to drive innovation yet not having total clarity and visibility to drive action. Rather than managing isolated siloes of telemetry, TSO Logic collects and connects these points of critical data to deliver visibility and performance analytics along with the automated actions to drive transformation and optimization. The goal has always been to deliver intelligence and action, monitoring and managing workload placement so teams can focus on driving the business forward.

The backbone of the TSO Logic Platform is a set of proprietary algorithms that empowers data center leaders to bring together every silo, analyzing live data streams to show the most efficient and cost-effective way to optimize application delivery. With complete visibility into compute and application delivery, predictive action can be established and automation can be realized.

Fact-based indicators enable fast decisions that yield faster business performance. Automation enables the optimal placement of workloads according to real-time business needs. TSO Logic enables smarter decisions and powers automated actions to take the guesswork out of optimization. By isolating underutilized and unneeded systems, the integrated TSO Logic Platform automatically identifies ways to optimize IT and reduce server sprawl. It also enables IT to clearly demonstrate the need, if any, for future capital expenses — without having to rely on assumptions based on guesswork about past performance. By addressing both reduced OPEX and CAPEX, the total cost of operations can be quickly optimized, documented and transformed.



To learn more about the TSO Logic platform visit us online at [tsologic.com](https://tsologic.com). Regardless of where you are now – Cloud, on-prem or hybrid – TSO Logic can work to identify real cost savings today. To see just how much, visit our interactive Savings Calculator at [tsologic.com/savings-calculator/](https://tsologic.com/savings-calculator/) to see where efficiencies are waiting. Now that you are ready to start optimizing performance, request a TSO Logic Platform demo to show where and how transparency can transform your business operations.

Transformation requires visibility and the tools to help you navigate a path to optimization. TSO Logic is the easy first step to bring that clarity to your fingertips.

# TSO Logic