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# SELECTING A DATA CENTER PLATFORM

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# CTO Advisor Hybrid Infrastructure

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# Introduction

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Information Technology Decision Makers (ITDM) must weigh their limited resources against ever-increasing regulatory, compliance, and business demands. Beyond cost, ITDMs must consider the challenges of growing competition for technical [talent](#). In previous hardware generations, ITDMs could rely on processor speeds and feeds to make data center purchasing decisions. The decision is much more complex in the current age of abstracted systems.

The CTO Advisor recently selected a new data center platform to support conducting research based on proof of concepts in the [CTO Advisor Hybrid Infrastructure](#) (CTOAH).

The paper will share how we selected an OEM product based on the 3rd Gen Intel™ Scalable Processor before Intel reached out to sponsor this paper and research.

The architect or executive will walk away from this paper with the considerations needed to select a data center platform. We've teamed with Gestalt IT to provide low-level details around specific use cases outside the generalized requirements of the CTOAH. Gestalt IT looks at configurations such as Machine Learning and Artificial Intelligence (ML/AI), Virtual Desktop Infrastructure, and Multicloud.



# The CTO Advisor Hybrid Infrastructure

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The CTO Advisor Hybrid Infrastructure (CTOHI) is a purpose-built infrastructure that follows the modernization path of the enterprise infrastructure. We journey from on-premises infrastructure to a hybrid infrastructure that extends to the public cloud.

Projects within the CTOHI infrastructure include the following:

- [Extending Virtual Desktop Infrastructure](#) (VDI) to the public cloud in response to a demand to quickly transition from working in an office to working from home.
- [Deploying networks using abstractions](#) with Juniper Apstra.
- Building a framework for [modernizing applications](#) with Google Cloud.

## Problem Statement

To date, our research leveraged DellEMC PowerEdge 730XD running 1st Generation Intel Scalable Processors. We found the Intel Scalable processors more than adequate for our workload needs. However, we experienced project budget and time overruns related to managing the data center control plane.

These overruns weren't limited to the server platform. The nature of our proof of concept (PoC) projects mimics many large enterprise and cloud providers. CTOHI operates enterprise-grade hardware, including Arista Networks, Fortinet Security, and VMware vSphere VSAN. Our control plane must support a wide range of applications and business outcomes.

Our story is all too common of how organizations compound technical debt. CTOA faces finite technical resources in infrastructure operations. An increasing number of clients are asking for cloud-native related PoCs. However, we've spent too much time on undifferentiated infrastructure tasks. Before starting the most recent cloud-native project, the CTOA data center architect proposed spending 60 hours researching the

upgrade from vSphere 6.7 to 7.0u1. A typical PoC comprises 125 engineering hours. As with any modern infrastructure team, we needed to do more with less.

## Requirements

As CTOA looked toward projects such as Kubernetes, Server-side Web assembly (WASM), cloud-based control planes, and application modernization, the CTOA team realized the enormity of the task. The on-premises hardware must represent a pod in a cloud-scale data center. Therefore, the team had to consider the storage platform, server hardware, security, and operations.

Most of the data center workloads are run (including test runs) on virtualized X86. Therefore, X86 compatibility became a hard technical requirement. Functionally, the solution had to reduce the reliance on skilled technical labor to perform essential maintenance of the virtualized infrastructure by an order of magnitude. The target platform must provide a flexible design to test a wide range of data centers and cloud infrastructure technical PoCs.

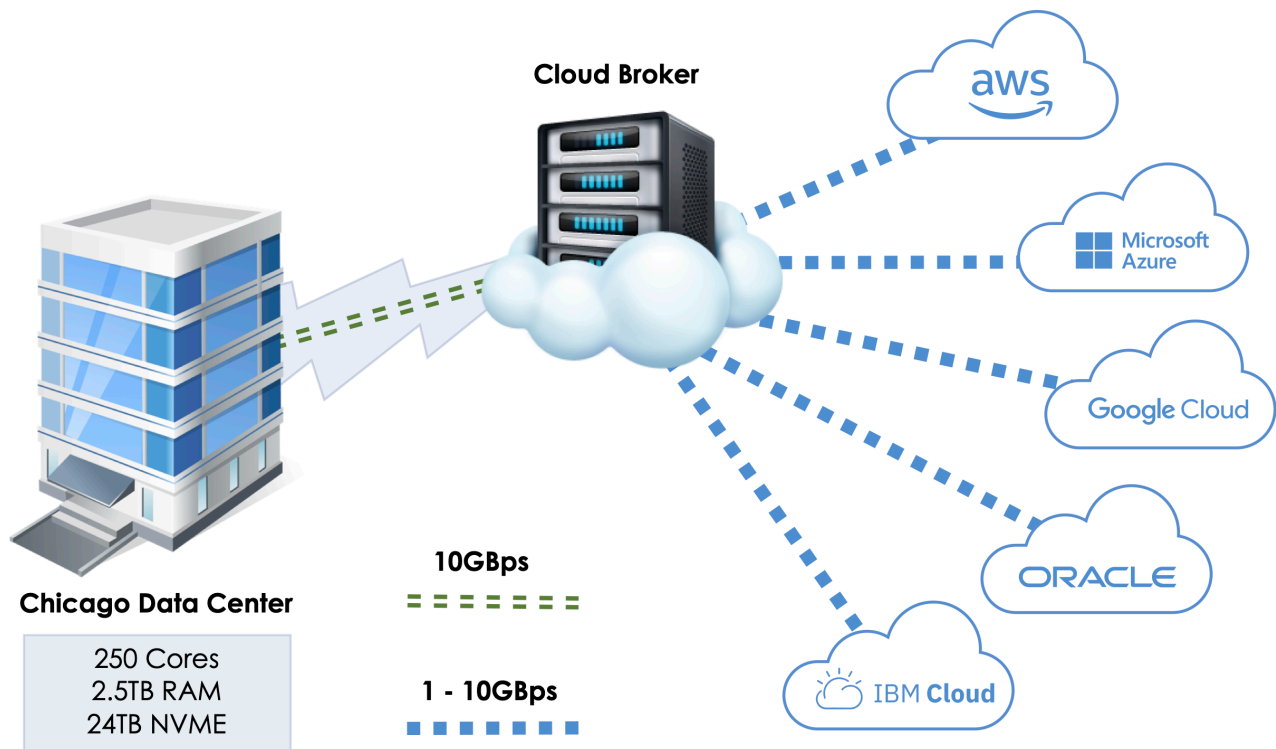
# The CTO Advisor

## Hybrid Infrastructure

### Engineered Systems

Not wanting to spend valuable engineering efforts on low-level system design, the CTOA decided on an engineered systems approach for the solution. An engineered system would allow the team to rely on original equipment manufacturers (OEMs) to provide a near-turnkey solution for performing control plane upgrades. The engineered system base would

allow CTOA engineers to focus on higher-value work such as application modernization. Our prior research around HPE's dHCI and DellEMC VxRail provided the proof points we needed to proceed in selecting an engineered system. See [VxRail/HPE](#) research.



CTO Advisor Hybrid Infrastructure

# AMD vs. Intel Engineered Systems

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With a base approach selected, we answer whether there is a material difference in selecting AMD vs. Intel in our use case. Both AMD and Intel met our single technical requirement—our use case is one that x86 is x86. We'll look at the deciding factors for our specific use case and call out factors the reader may consider.

## Strength of Platforms

Intel highly promotes its data center platform based on Intel 3rd Gen Xeon Scalable Processor™ processors. AMD promotes the performance metrics of the EPYC™ line of processors. Each CPU manufacturer is playing to its strengths. AMD demonstrates competitive speeds and feeds in several areas, while Intel's data center platform is unmatched by any CPU vendor.

Twitter [detailed](#) how combining Intel Xeon Scalable Processors™ with Intel Ethernet 800 Series network cards enabled the hyperscaler to reduce trail latency and deliver a better user experience. We talked to several high-performance customers, and they relayed similar experiences across security, networking, and overall data center performance.

AMD promotes the individual processor performance to comparable Intel processors. Our conversations with customers revealed that Intel's efforts around optimization of the entire platform result in reduced cost and higher application performance. The result is higher efficiency and reduced power consumption due to the need for less physical data center capacity.

## Product Selection

HPE and Dell Technologies offered systems based on AMD and the Intel platform. Each platform fits the requirement that our engineers benefit from the reduced effort for system design and control plane integration by an order of magnitude.

In discussions with HPE and Dell Technologies, Intel's data center-wide perspective offers unique advantages. The [VDI optimized VxRail](#) system is an example of the collaboration between Intel and OEM. Dell Technologies offers a DellEMC VxRail configured with Intel Optane Persistent Memory (PMEM). The system is designed to offer a balance between performance and cost.

We found the Intel's data center-wide features of surprisingly strong benefit. If we wanted to perform a PoC with a Software Defined Networking solution that leveraged a solution such as Data Plane Development Kit (DPDK) with an intelligent network card, the Intel-based solution offered a turnkey system coupled with Intel 800-series Ethernet Adapters. None of the OEMs offered a comparable AMD-based solution as of this writing.

Each OEM offers substantially more configurations based on Intel than AMD. Specifically, Dell EMC's VxRail comes in multiple configurations supporting Edge, Rugged Edge, Data Center, and VDI optimized. Of the six types of configurations, Dell Technologies offered two types of systems with AMD (vs. six with Intel).

The CTOA team selected an HPE dHCI system based on the Intel Xeon Scalable Gold processor with Intel 800 Series Ethernet. The resulting investment has reduced our time to update the control plane to hours vs. days via HPE-provided automation. Post-acquisition proof of concepts has included VDI testing leveraging Intel Optane PMEM to increase system capacity.



# Conclusion

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While an AMD Epyc or Intel Xeon Scalable system would meet the technical and functional requirements of the CTO Advisor Hybrid Infrastructure, we found a much more robust marketplace surrounding the Intel Xeon Scalable systems. Customer after customer detailed leveraging Intel's data center architecture to increase performance, improve efficiency, and reduce the overall cost of the data center.

The CTO Advisor's experience is not unique. The technical team at Gestalt IT goes into significant detail on other use cases and platform comparisons. While we find use cases for AMD Epyc's unique features, the decision criteria of a modern data center design consider much more than the speeds and feeds of the processor component.

