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Modern Compute Operations Management, Tools, and Platforms

HPE and Intel Help Boost Return on IT
Investments by Optimizing and Automating
Compute Management

ED TITTEL

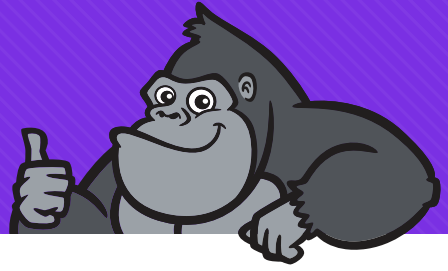


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IT Investments by Optimizing and
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By Ed Tittel

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DIRECTOR OF CONTENT DELIVERY

Wendy Hernandez

GRAPHIC DESIGNER

Olivia Thomson

HEAD OF SMARTSTUDIO

Katie Mohr

WITH SPECIAL CONTRIBUTIONS FROM CLIENT NAME

Bailey Bender

COMPUTE PRODUCT MARKETING
SPECIALIST, HPE

Robert Checketts

SR. MANAGER, COMPUTE PRODUCT
MARKETING, HPE

Natalie Golden

HPE

ABOUT THE AUTHOR

Ed Tittel is a 30-plus year veteran of the IT industry who writes regularly about cloud computing, networking, security, and Windows topics. Perhaps best known as the creator of the *Exam Cram* series of certification prep books in the late 1990s, Ed writes and blogs regularly for GoCertify.com, ComputerWorld, and other sites. For more information, including a resume and list of publications, please visit EdTittel.com.

ENTERING THE JUNGLE

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CALLOUTS USED IN THIS BOOK



SCHOOL HOUSE

In this callout, you'll gain insight into topics that may be outside the main subject but are still important.



FOOD FOR THOUGHT

This is a special place where you can learn a bit more about ancillary topics presented in the book.



BRIGHT IDEA

When we have a great thought, we express them through a series of grunts in the Bright Idea section.



DEEP DIVE

Takes you into the deep, dark depths of a particular topic.



EXECUTIVE CORNER

Discusses items of strategic interest to business leaders.



DEFINITION

Defines a word, phrase, or concept.



GPS

We'll help you navigate your knowledge to the right place.



KNOWLEDGE CHECK

Tests your knowledge of what you've read.



WATCH OUT!

Make sure you read this so you don't make a critical error!



PAY ATTENTION

We want to make sure you see this!



TIP

A helpful piece of advice based on what you've read.

INTRODUCTION

In today's modern organizations, compute operations management (aka COM) leverages advanced technologies to get things done more quickly and efficiently. Such leveraging embraces artificial intelligence, big data, automation, and cloud computing to streamline and optimize how compute resources get organized, accessed, monitored, and managed. These leading-edge technologies are specifically intended to support more data-driven, relevant, and customer-oriented operations alongside a holistic and global view of the entire enterprise from end to end, in data centers, at the edge, and in the cloud.

Typical components or aspects within a COM environment include at least the following:

- Centralized management platforms provide a proverbial “single pane of glass” for monitoring and management, with clear visibility into distributed compute environments that include private and public clouds, plus on-premises elements
- Automation of routine everyday tasks, real-time monitoring and proactive, intelligent alerting work to reduce manual effort, improve server and system health, and ensure compliance with regulatory and other information standards and policies
- A deliberately holistic approach to compute management means organizations can scale operations efficiently as they deliver high performance and maintain stringent security standards

In general, modern COM seeks to protect and secure its systems, data, and assets while making them accessible and available to authorized users, systems, and connections.

In this Gorilla Guide, you'll find a basic primer on COM, along with discussions of key related HPE and Intel technologies useful for supporting and securing a modern digital enterprise. That means as you go down this trail, you'll also find discussions of key HPE and Intel technologies to protect, preserve, and manage HPE ProLiant servers powered by Intel Xeon Scalable processors. Likewise for key supporting software, systems, and infrastructure that serve to establish and maintain COM across an entire enterprise including cloud-based assets and resources.

CHAPTER 1

Introducing Modern Compute Operations Management

In practice, Compute Operations Management may be reduced to its initials—namely, **COM**. But it's more than just an acronym. It's an outright digital discipline that seeks to define and employ a set of conceptual and physical models, within a body of best and accepted practices. Ultimately, the goal of COM is to position all elements of an IT infrastructure into a well-understood framework, which plays into a lifecycle model through which technology is continuously evaluated, chosen, deployed and maintained and finally, replaced with newer and presumably more capable alternatives. Thus, COM is best understood as a process that involves computing within a framework of practices and procedures used according to a management discipline. Indeed, COM unites users, IT staff, operations and security professionals, and business stakeholders (including executives) across the whole enterprise.

The COM Breakdown, Part 1: What Is Compute?

Simply put, compute is an abstract service that's made available to authorized users who which to acquire, access, analyze and manipulate data. It's easy to over-simplify compute as the sum collection

of computing devices in an enterprise. But compute also embraces resources beyond computation and includes memory that applications and operating systems use to perform tasks, storage from which (and into which) data comes and goes, and the networking links and infrastructure that brings users, resources, and services or applications together.

The COM Breakdown, Part 2: What About Operations?

In modern organizations, the IT operations function—which may be called IT Operations, or abbreviated as ITOps—seeks to ensure, secure and maintain smooth functioning of the IT infrastructure, and other key related capabilities, all managed with one eye on tools and technologies and the other on business goals and strategies.

To maximize and optimize return on IT investments, ITOps covers these key roles in modern organizations:

- **System Administration:** Managing and maintaining IT systems, including servers, databases, and networks.
- **Service Management:** Ensuring that IT services are delivered efficiently and effectively to meet business needs.
- **Security Management:** Protecting IT systems and data from cyber threats and ensuring compliance with security policies.
- **Software and Hardware Deployment:** Installing, updating, and managing software and hardware components.
- **Network Operations:** Monitoring and managing network performance, troubleshooting issues, and ensuring connectivity.

- **Support and Maintenance:** Providing technical support to users and maintaining IT infrastructure to ensure reliability and performance.

Operations plays into compute by organizing and marshalling its resources and functions, to make sure that systems and services are properly configured, correctly secured, and kept up-to-date as new threats emerge, new tools replace old ones, and new technologies get adopted. In some organizations this may also involve a development organization, and incorporate related functions such as need analysis, software design and architecture, development and test, deployment and maintenance, user support, and more.

The COM Breakdown, Part 3: Why management Is Key

In the COM context, management is best understood as the driver who keeps the wheels turning as they should be, and what makes sure the organization's IT capabilities work as they should, when they should, across the enterprise. In the COM triad, compute describes what gets used and consumed, and operations describes the roles and capabilities that fall beneath the IT umbrella. Management brings all the pieces together, and defines processes, procedures, policies, events and schedules, and governance for what gets managed (compute) and what kinds of tasks and activities are involved (operations). It also addresses the key notion of access control, which keeps track of who's authorized to do what in the enterprise, and associates tools for authentication to prove one's identity as part establishing and maintaining proper security.

Compute Operations Management à la HPE and Intel

FIGURE 1 shows how COM figures into a complex IT environment. Individual users (labeled Administrator, Operator, and Observer at left) go through an Authentication facility to obtain access to COM. This might mean a typical account–password login, though multi-factor authentication is highly recommended and nearly ubiquitous. (via third-party tools such as Okta, Onelogin, Google

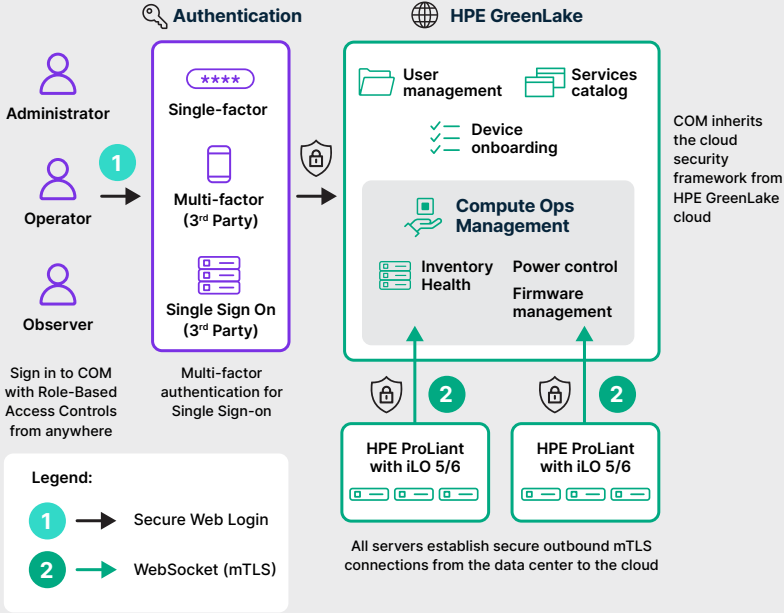


FIGURE 1: Within an HPE environment, both users (left) and servers (below, at multiple sites) access its cloud-based HPE GreenLake Compute Operations Management capabilities

Authenticator, MS Entra, and so forth, or native HPE Single Sign-On, and other third-party SSO facilities such as CyberArk, Autho and more). On the other hand, servers and other network devices use secure, certificated based Transport Layer Security (TLS) to establish valid identities and interact with management tools such as inventory, health, power control, and firmware management.

In the next chapter, you'll leave the generalities of Compute Ops Management behind and dig into how HPE's ProLiant servers use demonstrably secure identity information, secure firmware inside a silicon root of trust that creates a fingerprint for 4th and 5th Gen Intel Xeon Scalable processors that must be matched exactly before the server will boot. This establishes and maintains server security from build-out, to transport and delivery, to configuration and set-up, and on into the useful, productive parts of the lifecycle. Keep reading for the next riveting adventure on this important trail. Further down the trail (in Chapter 4, in fact), you'll learn a great deal more about HPE Compute Ops Management in the context of HPE GreenLake, HPE's cloud-based hybrid cloud solution that lets organizations bring a public cloud experience to all its computing services, even within on-premises data centers.

CHAPTER 2

Starting from Silicon: HPE Integrated Lights Out (iLO) Management

As is so often the case, HPE's purpose-built server management technology goes mostly by its acronym. It's called HPE Integrated Lights Out, but it is universally known as iLO. Indeed, iLO provides the foundation for per-server management, but also includes the interfaces through which sophisticated management platforms and tools can interact with HPE ProLiant servers powered by Intel Xeon Scalable processors. That's what's shown at the bottom of Figure 1 in the preceding chapter, in fact (and names the Mutual TLS or mTLS connections, in which both parties authenticate to each other using TLS certificates, to establish bona fides and set up a secure, encrypted connection between COM on one side, and a ProLiant Server (or site) on the other side.

What makes iLO both valuable and interesting is that it keeps working even if network connections go down or become unavailable or non-responsive. iLO includes separate hardware and so-called out-of-band (OOB) connections that let COM interact with, and even cold start, an iLO-equipped server using a separate remote connection (which may be some kind of wireless or telephone link, a separate network link, and so forth).

Out of band (OOB) Terms and Capabilities

The cognomen comes from iLO's ability to establish and provide remote access to HPE ProLiant servers powered by Intel Xeon Scalable processors, even when no network connection is available. That's the basis for the "lights-out" designation, which uses OOB connections to reach out and interact with devices as needed. They even work when the lights are out at a remote location and provide an alternate path into networks and devices for troubleshooting when the normal paths are blocked or MIA.



Basic Characteristics of iLO

Integrated Lights Out provides a bevy of useful capabilities designed to let admins interact with servers even when normal communications channels—or the servers themselves—aren't working. These include the following key characteristics which offer life-saving (or server-saving) opportunities galore:

- iLO out-of-band management lets admins interact with Intel Xeon-powered HPE ProLiant servers remotely to configure, monitor and update them, even if they are offline or inaccessible
- iLO offers important management facilities that include remote console access, KVM over IP, and a wide range of automated management tasks for configuration, set-up, firmware and software updates, and more

- iLO's primary impetus is to simplify and streamline server setup, troubleshooting, and firmware updates, and it delivers on that promised capability in spades

All in all, iLO provides secure and efficient server operations under even the most trying of circumstances.

Why Do Organizations Need iLO?

First and foremost, iLO opens avenues to 24x7 uptime so organizations can maintain functionality and deliver mission critical services. Indeed, iLO provides a means to get to servers even if the network is down, or a server shuts down or crashes for any reason. This access then extends to key IT assets such as routers, firewalls, servers, switches, power, and telecom gear through an iLO connection. Thus, admins can investigate, repair, and bring their networks back to life. iLO provides key technologies to bridge such gaps as and when they're needed.

Where Does iLO Get Its Value?

iLO is built into all HPE ProLiant servers powered by Intel Xeon Scalable processors and includes scalable licenses with mobile app features to support IT staff anywhere at any time. iLO uses its own proprietary, discrete microprocessor chip, with separate power supply and communications links. That's how it remains available even if a server fails outright. iLO can reach out to diagnose what's wrong, and then fix things quickly and efficiently even if the server is powered down. At the same time HPE iLO provides a toolbox of capabilities to help automate and simplify server provisioning, troubleshooting, and firmware updates.

Introducing HPE Intelligent Provisioning

The server deployment and maintenance facility that's embedded in HPE ProLiant servers powered by Intel Xeon Scalable processors is firmware-based. Thus, it requires no physical media to access and run. Furthermore, HPE Intelligent Provisioning software available through iLO speeds server deployment and maintenance through the following capabilities:

- Step-by-step deployment assistance
- System configuration via guided, profile-driven or scripted pathways that integrate seamlessly with standard IT processes and practices
- iLO recognizes when system software is out-of-date, and prompts download and install of current updates

iLO Provides Critical Connection Capabilities

The same remote access, KVM and automation supports built into iLO are also available to external management tools and platforms. In the next sections, you'll learn about integrated management platforms that interoperate with HPE ProLiant servers powered by Intel Xeon Scalable processors. In the following chapter, you'll learn more about an entire, cloud-based COM facility built into the company's on-demand, cloud-based HPE GreenLake platform. It provides global holistic monitoring, management, automation capabilities for the entire enterprise, on-premises and into private and public clouds.

iLO runs on the server side to provide a point of entry and control on an individual device. In the next chapter, we shift our focus from a server-at-a-time view to one of HPE's best-known and still widely used management consoles—namely, HPE OneView. You'll learn more about important and ongoing uses of this toolset that should keep OneView running and gunning for many years to come.

CHAPTER 3

HPE OneView

HPE OneView is a powerful IT infrastructure management software especially designed to simplify and streamline management, monitoring, and automation of on-premises HPE ProLiant servers powered by Intel Xeon Scalable processors. HPE OneView offers the following capabilities:

- On-premises Infrastructure management software
- Provides composable solutions across compute, storage, and networking resources
- Supports HPE Synergy and dark sites

For the record, HPE Synergy is a composable, software-defined infrastructure (includes virtual switches, networks, servers, storage, and more) designed for hybrid cloud environments. It supports fluid pools with physical and virtual elements for compute, storage and network fabric that can be arranged into any configuration to handle a full range of workloads. In the same vein, a dark site describes a pre-production environment used to test and validate code (and code changes) before deployment into live production environments. That makes a dark site something for IT teams to safely test updates, configurations and new deployments without impacting production systems and real users.

OneView Remains Alive and Well

Contrary to the widespread belief among some customers, HPE OneView is neither obsolete nor on its way out the door. In fact, OneView is absolutely the right tool for HPE customers using Synergy, or those who operate dark sites as part of their development and test environments. Indeed, OneView provides a way to bring such things together within a single, unified management console and a shared set of tools, visualizations, automation and more.

HPE OneView remains an active, supported go-forward solution. Based on a conservative view over our product timelines, HPE intends to support and develop OneView for the foreseeable future. Though third-party sources may occasionally—and incorrectly—label OneView as a legacy tool, it remains an important, even vital part of HPE's Compute Operations Management strategy and toolset.

Indeed, a significant majority of HPE's current major compute accounts have standardized on HPE OneView. They use OneView daily across various mixtures of rack mounted and HPE Synergy servers. HPE plans to keep OneView going to serve existing and new customers, especially those who use Synergy and/or dark sites as part of their IT infrastructures. For those reasons, the company will keep investing in new, value-added OneView features and functions. Indeed, HPE is committed to main OneView as the preferred management platform for Synergy and dark site situations as far as the company's planning horizon extends.

What HPE OneView Brings to the Party

OneView lets authorized administrators use a single, consistent set of consoles, tools, and automation to interact with on-premises and

cloud-based Intel Xeon-powered HPE ProLiant servers and related resources. It also consolidates and coordinates alarms, alerts, notifications, and workflows (including updates, configurations, and more) across all servers and resources under its purview. In particular, OneView offers users the following benefits:

- A unified interface for managing compute, storage, and networking resources, allowing IT administrators to deploy and manage infrastructure more efficiently
- Administrators can create and manage server profiles and templates, automate routine tasks, and ensure consistent configuration across the entire infrastructure
- Real-time monitoring and alerting, helping to proactively address potential issues before they impact operations

OneView Also Leads into GreenLake Compute Ops Management

Even better—as you’ll learn more in this next chapter—HPE OneView integrates with automation tools and cloud management platforms, such as HPE Compute Ops Management, thereby enabling seamless orchestration from core to cloud for the whole enterprise. This includes a veritable cornucopia of capabilities, such as:

- **Manage Software-Defined Infrastructures:** Through Synergy, organizations can create virtual networks, servers, storage and entire infrastructures. OneView makes them easy to define, manage and maintain wherever they’re housed (on-prem or in the cloud).
- OneView supports powerful automation to deploy infrastructures faster, simplify lifecycle operations and increase productivity (for more info, see [Infrastructure automation made simple](#))

- OneView helps make infrastructure programmable, so that infrastructure elements can be composed like code, using special scripts that automate and increase agility. This helps make IT tasks predictable and ensures compliance.
- OneView lets organizations connect from core to cloud: It can provision turnkey private cloud infrastructures, or integrate with preferred cloud platforms (e.g., AWS and Azure). This simplifies project outcomes and ensure timely, high-quality delivery.
- Admins or developers can work with the OneView API directly, to define, refine and optimize workflows, automation, infrastructure compositions, and more to improve productivity and speed deployment.
- A single, cohesive OneView Dashboard brings all the pieces together, so admins can view and interact with infrastructures and dark sites using a consistent set of views, tools, automation and more.
- Beyond HPE's implementation and platform, a plethora of OneView Partner Integrations is also available (and worth perusing for the likes of VMware and Microsoft).

CASE IN POINT: BRAZIL'S PORTO ITAPOA

Porto Itapoa is a major Brazilian container terminal facility that's recently updated its data and computing infrastructure. That modernization effort boosted its container handling capability and overall efficiency, for a 67% boost in daily gate transactions. That puts the company on track to meet its ambitious goal to process 2 million containers yearly, raise port efficiency rankings, and attract more vessels—and business.

To obtain the level of performance and availability it needed, Porto Itapoa implemented HPE Alletra 9060 storage and HPE Synergy 480 infrastructure servers across its IT domain. That included ERP, berth management, and external portals, with support from HPE Services

and channel partner Sercompe. Its new deployment ensures constant system availability, accelerates access to portals and data, and improves container handling with faster berth planning and decision making. These improvements come in no small part from the 100% data availability that HPE Alletra 9060 delivers with fast, consistent performance and minimal latency even at scale. HPE OneView makes managing all the Synergy and Alletra components involved an absolute snap!

ABOUT HPE COMPUTE OPS MANAGEMENT, ONEVIEW ADDITION

HPE offers an add-on subscription service for OneView organizations. It aggregates HPE OneView connections into HPE GreenLake centralized, cloud-based console. This facility readily supports multi-site

Engaging with HPE consulting Services for OneView—and Beyond

HPE's global Consulting Services arm offers end-to-end support for organizations using OneView, iLO, and even GreenLake Compute Ops Management. Its offerings let organizations choose as much—or as little—help and support as they may need. That includes design, deployment and implementation services for these platforms, and ongoing or on-demand technical support and troubleshooting services. Organizations can also ask HPE Consulting services about related training and education offerings, available on-site, online, or at scheduled training sites. (Please note: the OneView Global Dashboard Essentials class is a particular favorite among HPE customers.)



management interaction, including reporting and analytics for HPE OneView Appliances and other connected infrastructure Devices. For organizations moving into or already heavily invested in the Cloud, this provides a great means to bring Synergy and dark site resources under the same general COM umbrella. This offering is called [HPE GreenLake for Compute Ops Management – OneView Edition](#). For the with the right mix of platforms, it's well worth looking into.

Though OneView supports various methods for cloud access and integration, it is primarily an HPE ProLiant server-focused management console and toolset. Options and opportunities really open up when you look at HPE's cloud-native management platform HPE GreenLake for Compute Ops Management. By no coincidence whatsoever, that naturally leads us into Chapter 4 where we dig into HPE GreenLake Compute Ops Management in some detail.

CHAPTER 4

HPE Compute Ops Management

HPE Compute Ops Management is a cloud-native management platform. It's designed to simplify and automate management of compute resources wherever they may reside, on-premises or in a private or public cloud. HPE Compute Ops Management provides a single, centralized cloud-based console for all connected assets and resources. Admins can use it to access, monitor and manage servers across a wide range of distributed environments (see **FIGURE 2**). With a subscription to the OneView Edition for this platform, such management even extends into Synergy infrastructures and dark sites.

HPE GreenLake Compute Ops Management Features



Key HPE Compute Ops Management features include the following:

- Real-time monitoring for health, events, alarms, alerts, logs and more
- Automated lifecycle management, with a large collection of pre-defined, customizable workflows for routine tasks, on- and offboarding, user equipment handling and more

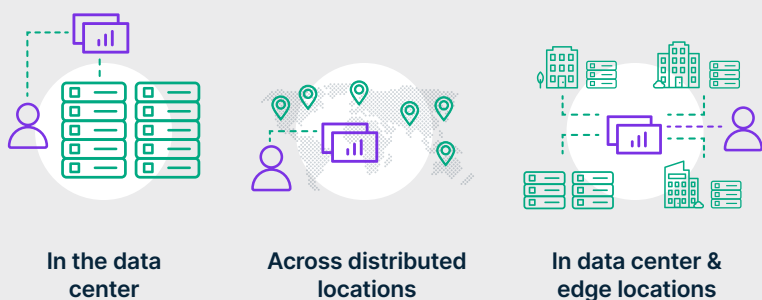


FIGURE 2: HPE Compute Ops Management allows teams to manage everywhere from anywhere

- Demonstrably secure operations based on Mutual Transport Layer Security (mTLS), security certificates, and tightly integrated identity, authentication and access control services

By design, HPE Compute Ops Management allows organizations to unify and aggregate compute management across the entire organization. It uses AI and automation to reduce manual effort, improve IT efficiency, and to enforce and ensure compliance with rules, regulations, and applicable mandates, with policy enforcement and governance integration:

- A single global console with secure Single Sign-On (SSO) unifies server management from edge to cloud to data center
- As with other HPE management Tools, it uses underlying iLO access for fast, simple server provisioning and management
- Works wherever a server is situated, from edge to cloud and into data centers

- Provides the same, consistent single console for remote access, monitoring, and management
- IT can focus on managing infrastructure and services, rather than learning and managing complex toolsets
- Single sign-on provides access to a common platform that embraces security, compliance, elasticity, and data protection
- Superior as-a-service experience lets organizations manage their entire compute landscapes, with access to automated management, secure access, provisioning and setup, updates and maintenance, and more

Key Elements in HPE GreenLake Compute Ops Management:

The most important aspects of the Compute Ops Management available in HPE GreenLake come from its global, holistic, end-to-end enterprise coverage. Because of its accommodating design and flexible capabilities, it handles servers and infrastructures wherever they are. That means for organizations that adopt HPE GreenLake Compute Ops Management:

- Server management gets unified without boundaries
- Organizations can easily use APIs to automate server management across the lifecycle and the enterprise
- Cloud-based access uses highly secure channels for management and other services (growing list, more available soon)

CASE IN POINT: KIMLEY-HORN

For those not already in the know, Kimley-Horn is a U.S.-based planning, surveying, engineering and design consulting company. It's a project-driven business, with about half its efforts devoted to ongoing special projects, and the other half to incoming limited-duration projects. The company operates around 100 offices around the country, each with at least one server. The home office IT department is responsible for those servers but works with local IT staff on location to maintain its gear.

This highly distributed situation makes remote access vital, and poses certain challenges when servers get deployed, or their firmware needs an update. Before modernization, server changes or updates involved substantial data transfers and coordinated installation. It could also require as much as 5 hours of downtime during scheduled maintenance intervals. Kimley-Horn adopted HPE GreenLake Compute Ops Management specifically to simplify and unify managing complex infrastructures. But it also benefited greatly from automating essential admin and upkeep tasks.

A particularly helpful benefit of HPE GreenLake came from scoping updates for individual servers or sites. Instead of transferring huge data files to cover all bases, the system would download only the necessary files and data for updates scheduled through the system. Though Kimley-Horn is not completely finished with its deployment of GreenLake Compute Ops Management, it's convinced that new alerting tools and detailed dashboards should provide more and better information about overall server health. They say that because HPE listens to its customers and responds to their feedback, their solutions should help Kimley-Horn manage its servers faster, more easily, and with greater reliability. See this [case study](#) for all the details.

Working Together



In this Gorilla Guide, you've seen just how the right kinds of server management can support better uptime, guaranteed access, automate routine tasks and responses, and provide real visibility into your digital estate.

Now that we've reached the end of the trail, you should understand that HPE Compute Ops Management comes in various forms, with associated pieces and parts. But you should also know that these parts work together to improve what you can do, and how you can boost users' and IT's productivity through secure deployment, maintenance, updates, and more.

In fact, HPE and Intel have your management needs covered from silicon all the way into the private and public cloud. To learn more, check out these key assets:

- HPE Integrated Lights-Out [homepage](#), [demo](#), and [explainer](#)
- HPE OneView [homepage](#) and [GreenLake plug-in demo](#)
- HPE Compute Ops Management: [homepage](#), [explainer video](#), and [demo](#)

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ABOUT HPE



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