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Hitachi Unified Compute Platform: A Close-Up Analysis of the IT Economics Necessary for Meeting Business-Defined Demands

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Contents

Executive Summary 2

Introduction 3

Evolving Application Deployment 3

One Platform for All Workloads 4

The Secret Ingredient: Unified Compute Platform Director Software 5

Use Case Highlights 6

For SAP HANA Environments 6

For VMware Environments 6

For Oracle Databases 7

For Microsoft Exchange and SQL Server Environments 7

For Private Cloud and Cloud Enablement 7

Stimulate Cost Savings for the New Paradigm 8

The Role of IT Economics 8

Economic Impacts of UCP 9

Orchestrate New Savings 9

Need Less, Gain More 9

Compare Technologies 10

Case Study: Insurance Company Realizes Savings Over US$6.6 Million With UCP for Oracle Database 11

Methodology 11

Customer 12

Challenge 12

Solution 12

Results 12

Final Notes 13

Executive Summary

In the always-on and always changing realm of technology, business and IT must forge a new alliance to stay ahead of demands, navigate cost constraints, and continue innovating to win. At a high level, this is the gist of Business-Defined IT. By forming a symbiotic relationship, IT and business stakeholders can achieve a single, integrated and aligned set of business outcomes. Business-Defined IT places emphasis on mobility to attain highest levels of productivity and on significantly lowering total cost of ownership (TCO) to improve profitability. It also focuses on exploiting data throughout its lifecycle to generate new business insights, customer relations, revenue streams and accelerated time to value.

IT organizations are continuously working to meet these very dynamic business requirements, usually with the same repertoire of technologies — and the same budget. What is different now is that “the usual” no longer works for winning in the new business-driven paradigm. With relentless data growth and the ubiquitous state of technology, the capabilities to manage and scale the data center may seem impossible.

Transforming the data center involves moving away from traditionally managed asset silos or nonconverged compute servers, networking and storage systems. Converged infrastructure (CI) offers a more evolved platform for deriving greater cost efficiencies and time savings. When compute, network and storage resources are cohesively managed within one infrastructure, the potential arises for faster results and greater business value.

Hitachi Unified Compute Platform (UCP) takes the promises of CI to a whole new level, with single-pane centralized management of resources, virtualization and applications. Highly adaptable, with intelligent built-in software management and end-to-end orchestration, UCP expertly accommodates the voracious data appetite of future-focused businesses. UCP has the analytic dexterity and inherent virtualization features necessary to support highly dynamic and complex environments, including SAP, Oracle and VMware.

This paper examines the economic impacts of UCP. IT Economics from Hitachi Data Systems analyzes the various technology stages, from RISC-based, nonvirtualized environments and do-it-yourself (DIY) virtualization to generational iterations of CI, and pinpoints cost reductions at each juncture. Economic value is identified, measured and evaluated across mission-critical workloads, both by IT Economics from Hitachi Data Systems and through an independent customer case study conducted by Forrester Consulting. Results indicate that UCP is capable of disarming out-of-control data costs while providing a highly resilient and nimble converged infrastructure for all data.

Introduction

With the plethora of IT challenges and business imperatives so common across today's industries, the expedience and acumen of technology solutions matter. Most organizations are attempting to manage unbridled growth of data, applications, services and expectations all at once and without spectacular results. Do-it-yourself or DIY management of siloed resources is often too manually intensive and expensive to sustain and scale over time to meet extraordinary workload demands and growth. Organizations want to leverage and protect existing investments, not rip and replace, to efficiently consolidate, virtualize and automate.

Converged infrastructure alleviates many of these problems, by deploying and managing compute servers, networking, storage, virtualization and applications collectively. CI centralizes, automates and simplifies using common provisioning and management tools to optimize resources and improve cost efficiencies. CI also boosts flexibility for private cloud opportunities and go-to-market timelines.

Evolving Application Deployment

New service level agreements (SLAs) and business requirements usually dictate that mission-critical applications are deployed sooner and more cost efficiently. As IT strategists consider how CI solutions might relieve persistent challenges, there is value in visiting the spectrum of application deployment models over the years.

Application deployment has evolved from do-it-yourself approaches through generations of CI to pervasive orchestration. Through these progressions, there is opportunity to identify their correlation to costs. Figure 1 depicts the deployment of virtual machines (VM) in each scenario (see below). As organizations move through the stages toward orchestration, the cost reductions are significantly improved. Extrapolating out cost reductions in a time-based method is accomplished by calculating TCO savings per VM per month.

For example, do-it-yourself environments claim more wait time for everything from ingesting and assimilating new content and new data sources to managing and scaling separate stacks or migrating and decommissioning systems. Nonconverged data centers tend to attract higher energy consumption and floor space costs. As organizations move to CI solutions, the time and cost efficiencies improve because of greater levels of virtualization and centralized resource management. Please note: Not all hypervisors are created equal, which can cause economic results to vary based on choice of hypervisor, application stack, size and age of the estate, rate of growth, and geographic location of servers and storage.

The recommendation here is for IT leaders on the CI buyer's journey is to factor in cost efficiency when deploying mission-critical applications: Assess the reductions of time, expense and effort needed to deploy the application.

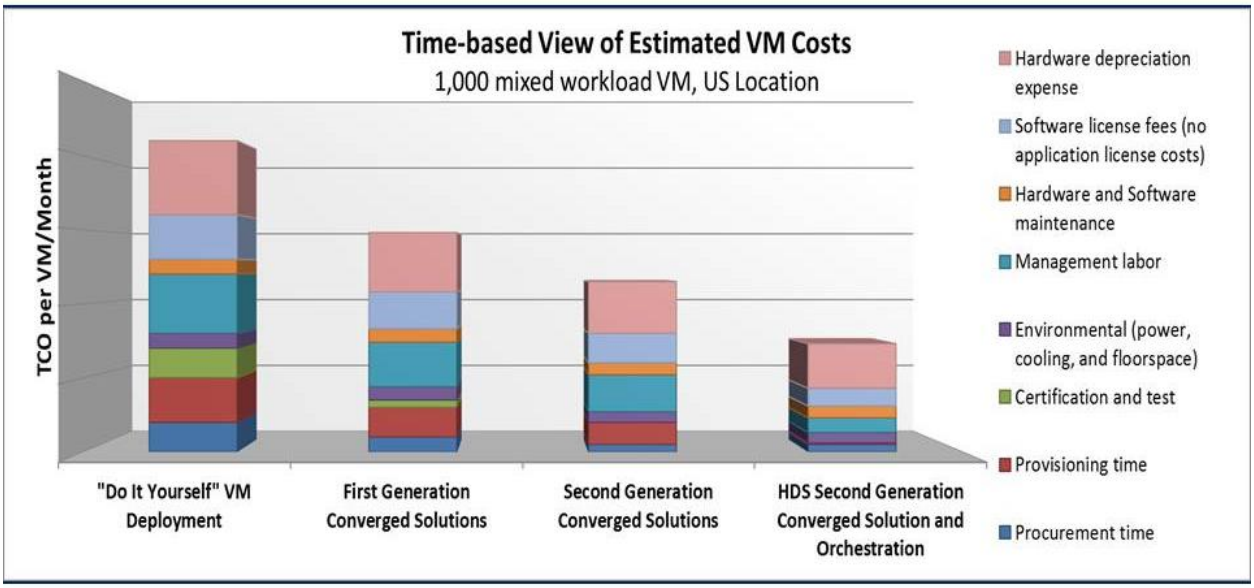

Figure 1. Progression of Application Deployment

Hitachi Unified Compute Platform

Hitachi Unified Compute Platform (UCP) is an enterprise-class family of converged infrastructure solutions with highest levels of efficiency, agility and resilience intended to fast-track more business value. UCP provides a truly solid foundation for protecting what is at stake, with best-in-class compute, networking and storage components, and superior software management of virtual and physical assets for mission-critical workloads. UCP solutions are custom built and certified to accelerate application deployment, private cloud and continuous operations.

One Platform for All Workloads

Hitachi UCP provides one platform for all data and workloads across virtualization and business applications, to catapult efficiencies and rapid deployment without technology compromises. Hitachi UCP is ideal for enabling the future-ready business, with:

- Faster time to deployment, production, market and return on investment (ROI).
- Support for continuous operations.
- Flexible IT and private cloud computing proficiencies.
- Expedited and sustained productivity and operational efficiencies.
- Substantially lower operating expenditures (opex) and risk.

Hitachi UCP solutions alleviate the guesswork that organizations often experience when deploying new infrastructure, for worry-free and immediate implementation. UCP offers superior VM density, nondisruptive operations, error-free template provisioning, ubiquitous automation and rapid deployment capabilities. UCP delivers seamless integration of automation, self-service, multitenancy and continuous technologies, and includes:

- Enterprise-class compute, networking and storage, with customer choice.
- Hitachi Unified Compute Platform Director software for supple, intelligent, simplified and centralized administration.

- Pretested and validated configurations for reference architecture or turnkey operations.
- 100% HDS support.
- Prevalidated application enablement for Microsoft, Oracle, SAP and VMware.
- Built-in flexibility to use Hitachi interface or integrate with existing management using RESTful APIs.

UCP can be rolled off the delivery truck, set up and provisioned in hours, not days or weeks. Across any application and any workload, UCP provides IT with:

- Comprehensive control of virtual and physical machines.
- Complete system visibility, monitoring and troubleshooting.
- On-demand provisioning and event-based actions.
- All-inclusive deep and wide data protection.
- Ability to nondisruptively add or change server and storage resources.
- One-source support.

The Secret Ingredient: Unified Compute Platform Director Software

A key differentiator among CI solutions is the management capabilities for visibility and control over compute, networking and storage resources. Hitachi Unified Compute Platform Director is intelligent, single-point management and end-to-end orchestration. In fact, Unified Compute Platform Director is able to capture intelligence across these layers and aggregate it for integration into existing and familiar management and orchestration tools: It provides a cornerstone for nimble private cloud environments.

With support for apps on bare metal operating system and automated nondisruptive firmware upgrades, Unified Compute Platform Director easily federates management for multiple collocated or dispersed UCP systems. This management solution simplifies inventory and provisioning tasks, and automates operations, monitoring and data protection for lower capital expenditure (capex) and opex. With a single software-defined view of the data center, Unified Compute Platform Director helps organizations gain the full value of virtualization investments and mission-critical application environments. Deep native integration of this solution into vSphere and vCenter also enables faster deployment of cloud infrastructure and efficient resource allocation.

“We see Unified Compute Platform Director as a game-changing technology. There is no other tool out there right now that can easily automate provisioning of space, provide crystal clear visibility within existing storage, or is truly aligned with VMware. This tool does it across multiple Hitachi UCPs, to repurpose, revitalize and mitigate underutilized resources. Unified Compute Platform Director is as revolutionary in this space as the iPhone has been for the cell phone market.”
— Ed Weigner, Director of Sales, U.S., oXya

Use Case Highlights

Hitachi UCP solutions are tested with specific applications, such as Microsoft® Exchange, SQL Server®, SharePoint® and Lync® Server, Oracle Database and the SAP HANA platform (see Figure 2). These applications are validated and certified to ensure compatibility, performance and supportability. They can be deployed as virtualized solutions for running multiple applications or dedicated application-optimized solutions. In addition, Hitachi Data Systems provides technical support needs for the entire solution.

More About UPC Family Solutions
DOWNLOAD

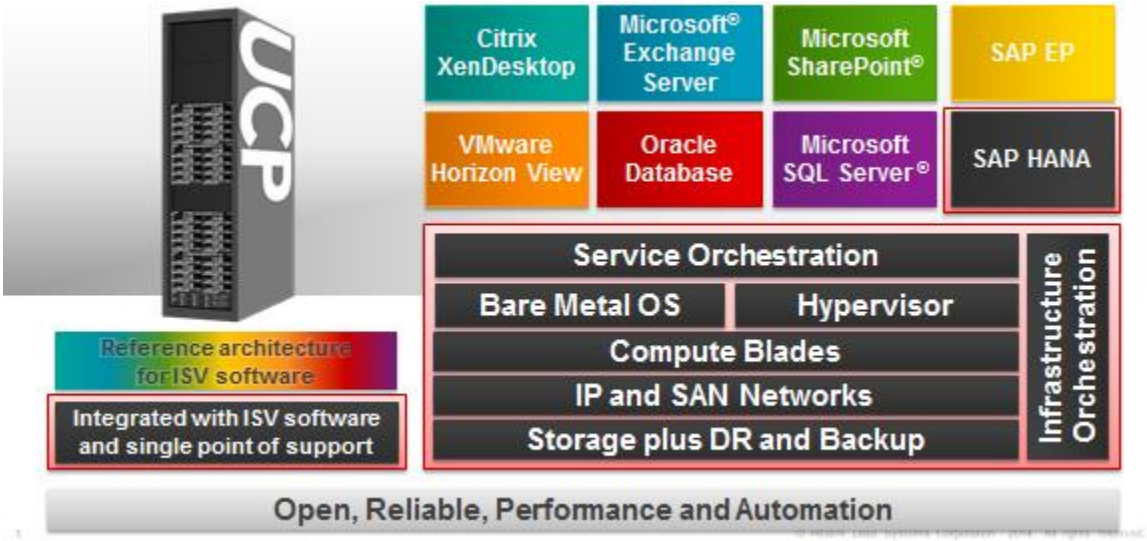

Figure 2. Numerous Use Cases for Hitachi UCP

For SAP HANA Environments

Hitachi Unified Compute Platform for the SAP HANA Platform is designed for real-time analytics and application deployments, and is built on the SAP HANA database. Available for scale-out and scale-up architectures, and delivered as an appliance or a service via the cloud, UCP for SAP HANA is ideally suited to manage mission-critical environments within a single enclosure. With high-speed in-memory analytics and certified, optimized infrastructure, UCP for SAP HANA helps advance business intelligence and innovation.

For VMware Environments

Hitachi Unified Compute Platform for VMware vSphere quickly simplifies management of physical and virtual resources to promote a virtualized data center infrastructure that lowers capex and opex. VMware vSphere transforms IT hardware into high-performance shared computing resources with application services that help deliver highest availability, security and scalability. UCP for VMware vSphere has native integration with the vSphere API engine so that multiple VMware servers can offload workloads to Hitachi storage, freeing server resources, reducing network traffic and improving infrastructure efficiency. As validated reference architecture, UCP for VMware vSphere supports predictable, low-risk cloud deployment and abstracts underlying infrastructure from apps and information.

> "We are pleased to work with Hitachi Data Systems to enable customers to realize the value of the software-defined enterprise. UCP with VMware vSphere provides customers with a reliable and efficient enterprise converged infrastructure solution."
>
> — Sanjay Katyal, Vice President, Global Strategic Alliances, VMware

For Oracle Databases

Hitachi Unified Compute Platform for Oracle Database enables streamlined high performance of mission-critical Oracle online transaction processing (OLTP) and online analytical processing (OLAP) read-intensive workloads, minus latency issues. This UCP solution combines Hitachi enterprise compute blades or rack-optimized servers, with Hitachi storage and best-of-breed networking to optimize Oracle databases, enterprise applications, data warehousing, analytics and business intelligence. Organizations gain a multitude of capabilities to meet SLAs for performance and data availability, and all the necessary tools to expedite and simplify.

For Microsoft Exchange and SQL Server Environments

Hitachi Unified Compute Platform for Microsoft® Exchange Server is a reference architecture intended to meet unique organizational requirements and flexible scalability with growth. With focus on planning, sizing and designing the environment for hosting VMs running Exchange workloads, this UCP solution fosters reduced risk, lower TCO and better predictability, scale and deployment.

Hitachi Unified Compute Platform for Microsoft SQL Server® provides a high-performance SQL Server database management system (DBMS) solution for data warehousing. This extremely reliable and scalable configuration supports even the most demanding database applications and workloads.

For Private Cloud and Cloud Enablement

Cloud promises cost reductions, on-demand applications and better all-round service and efficiency levels. Successfully managing cloud infrastructure requires real-time responsiveness to fluctuations in performance, workload demands, access control needs. For organizations considering CI to support private cloud, 3 critical principles must be met: self-service of applications, the ability to rapidly scale both up and down, and set up applications on a pay-for-use basis.

What sets UCP apart from other CI contemporaries is its powerful simplicity, speed and intelligence for delivering tangible benefits: easy usage-based consumption models with prebuilt and preconfigured templates; and lower opex with increased automated and straightforward cloud computing.

Hitachi Unified Compute Platform for Microsoft® Private Cloud is qualified, template and certified so that organizations can quickly deploy private cloud infrastructures in days and reap the benefits almost immediately, with predictable results, broader automation and ample orchestration. This UCP solution transforms how IT services are delivered, with Hitachi infrastructure-as-a-service and platform-as-a-service environments. The result is an application ecosystem designed and validated for mission-critical workloads and 100% SLA guarantees.

Hitachi UCP empowers organizations to run top-tier infrastructure applications without the traditional requirements of over-purchasing or overprovisioning unnecessary equipment. Unified Compute Platform Director chimes in with highly aware and proactive optimization for converged cloud ecosystems. As a cloud-ready infrastructure that bundles compute, network, storage and management resources, and scales without compromising performance, UCP is an excellent foundation for on-premises private cloud implementations.

UCP enables advanced self-service customization and business policy alignment features, which are so important for efficiently delivering cloud services. IT consumers, such as business units, can deploy departmental applications with speed and consistency using easy self-service portals to manage everything from automated provisioning, chargebacks,

subscriptions, billing and other functionality for private clouds. And IT maintains visibility and control over all the data and operations within and beyond data center walls.

Stimulate Cost Savings for the New Paradigm

Along the expedition to find the right converged infrastructure that meets an organization's specific needs is the ability to justify the purchase. To evaluate whether potential CI solutions will pass the test, the purchase justification must be first based on the business case and payback, not the IT need. It is paramount to also look beyond acquisition costs at other critical metrics that will make up the total cost of owning the system. These might include:

- Operating expenditures for the life of that equipment in service.
- Cost-reduction technologies within the actual infrastructure.
- Any new or hidden costs that might emerge.

The Role of IT Economics

Understanding the economics of IT must also evolve for the Business-Defined era. While the needs to justify purchases and leverage investments continue to stand the test of time, organizations are seeking new ways to measure the value of technology to the business. For 15 years, Hitachi Data Systems has tallied an extensive record of successfully helping more than 1,500 customers worldwide identify and capitalize on the long-term value of their storage purchases, with an average of 25% 1st-year cost reductions and sustained savings.

Today, IT Economics from Hitachi Data Systems builds on that proven framework for assessing the true costs and economic impacts of infrastructure to bridge technology and value in the new business paradigm. IT Economics takes a comprehensive, integrated approach to measuring what matters. Realizing the economic impact of potential IT solutions is integral to technology-imperative deployments, such as:

- Big data and business intelligence.
- Private, public and hybrid cloud.
- Hypervisor and virtual desktop infrastructure (VDI).
- Converged infrastructure solutions.

The role of IT Economics is to broaden the scope of what organizations ought to measure to accelerate desired business outcomes, efficiencies and innovations. IT Economics analyzes the entire technology stack to enable customers to derive the greatest business value from IT, and is supported by 4 principles:

1. *Acquisition price does not equal solution cost*. Planners need a holistic view of costs beyond the total cost of acquisition, which is usually only 20% of the TCO.
2. *Assess TCO*. Hitachi uses 34 cost categories to illuminate efficiencies that depict accurate hard and soft costs of infrastructure.
3. *Econometrics are a requisite for success*. To improve efficacy of infrastructure, it first must be measured, on an ongoing and consistent basis.
4. *Understand the value of superior architectures.* Not all technologies will reduce the right costs for the business so it is important to find the right balance of performance and value based on business need.

In addition to classic measurements, such as TCO, ROI and return on assets (ROA), IT Economics from Hitachi Data Systems also examines more modern and meaningful metrics for assessing value include:

- Total cost of ownership per terabyte.
- Total cost of ownership per application instance.
- Total cost of ownership per virtual machine.

[Sidebar]
The Ripple Effect:

IT Economics from Hitachi Data Systems helps organizations create a “virtuous cycle of cost reduction.”

A virtuous cycle is a self-propagating, advantageous situation in which a successful solution leads to more of a desired result or another success, which then generates still more desired results.

Economic Impacts of UCP

Transitioning to UCP provides both general and specific cost benefits. In this section, IT Economics pinpoints specific opportunities for savings and actual results via various methodologies.

Orchestrate New Savings

Hitachi Unified Compute Platform Director provides simplified orchestration of all infrastructure elements, with automation of administrative tasks, elimination of error-prone manual tasks, and less time to complete them.

- Unified Compute Platform Director **reduces the number of administrators** actually required to perform all the tasks. Rather than separate specialty administrators (for server, storage, network) involved in routine day-to-day activities, one generalist using Unified Compute Platform Director can manage the CI.
- Unified Compute Platform Director **reduces down time** with nondisruptive upgrades of firmware.
- Unified Compute Platform Director **quickly and cost-effectively improves SLAs.** The performance tuning feature alleviates lengthy, manual investigations or additional hardware purchases to improve performance.

Need Less, Gain More

UCP solutions are optimized and pre-validated, with pre-configured solutions for some of the most demanding mission-critical environments.

- Pre-validated solutions **reduce time required for testing, deployment, integration and setup,** resulting in less IT cost and faster time to service.
- Because UCP is an advanced CI with orchestration, organizations will **need less IT infrastructure to obtain better economic impact**: storage virtualization and tiering leverage existing legacy and 3rd-party investments; dynamic provisioning defers or reduces storage purchases; LPARs reduce stranded server waste by more than 50%, as well as some licensing costs because hard partitions are recognized by hypervisors as individual servers versus software partitions; high-density compute blades reduce space, power, cooling requirements; and the smaller environmental footprint has fewer spindles, a small drive form factor, and better capacity reclamation.

Compare Technologies

To show the savings and cost efficiencies of the UCP family of products, IT Economics from Hitachi Data Systems evaluated the UCP with Unified Compute Platform Director against 4 pertinent technology scenarios:

- Moving from RIS server workloads to Intel servers.
- Moving from nonvirtualized to hypervisor.
- Moving from DIY hypervisor to UCP.
- Moving from 1st-generation CI to UCP.

Table 1 shows the economic impact of these scenarios. Both hard and soft costs are measured. All 4 technology phases show substantial and real cost improvements, as indicated with checkmarks. Those with the highest financial impacts received 3 checkmarks.

	RISC	Non-Virtual-Machine (VM)	Do It Yourself	1st-Generation Converged Infrastructure (CI)
Hard Savings With Hitachi Unified Compute Platform and Hitachi Unified Compute Platform Director				
Higher VM density, fewer servers	✓ ✓	✓ ✓ ✓	✓	
Hardware maintenance	✓ ✓ ✓	✓ ✓	✓	
Better storage return on assets (ROA), less infrastructure	✓ ✓	✓ ✓	✓	✓
Hypervisor licenses			✓	
All software license and maintenance	✓ ✓ ✓	✓ ✓	✓	✓
Reduced network ports	✓	✓	✓	
Cost of waste, poor ROA		✓ ✓	✓	
Power and cooling	✓	✓ ✓	✓	
Management labor and overlap	✓	✓ ✓	✓	✓
Floor space	✓	✓	✓	
Migration	✓	✓ ✓	✓	✓
Provisioning time (ops)		✓	✓	
Soft Savings with UCP and Unified Compute Platform Director				
From delivery to production	✓	✓ ✓	✓	
Certification, test	✓ ✓	✓	✓ ✓	✓
Outage risk		✓		
Mean time to provision (client)	✓	✓ ✓	✓	✓

Table 1. Align Cost Areas to Technology Phases

For example, when moving from RISC-based workloads to Intel server workloads, IT, of course, can realize immediate savings by not having to maintain legacy systems or expensive software licenses. Moving one step along the evolution to Intel servers includes a lower cost platform to operate. Also, servers, memory and applications have a lower I/O price point compared to RISC servers.

When moving from nonvirtual environments to virtual servers, IT may have some workloads to move to a converged infrastructure. UCP with Unified Compute Platform Director offers advanced LPAR virtualization to maximize efficiency and utilization of blade server hardware: Each logical partition hosts its own independent operating system and application environment. The economic value is demonstrated with reduced power consumption, reduced floor and rack space, and optimized use of CPU and I/O resources for superior efficiency.

Another example, moving away from DIY technology scenarios, also means leaving behind management complexity, time-consuming troubleshooting, underutilized assets and pricey scalability. Every aspect of the cost analysis for movement to UCP is improved across all hard and soft costs.

[callout]

Going from a DIY virtualized environment directly to UCP with Unified Compute Platform Director is likely to reduce unit costs by up to 40%, with a significant improvement (up to 4:1) in density and better server utilization.

Upgrading from earlier CI generations to UCP with Unified Compute Platform Director boosts savings by mitigating scaling costs and applying end-to-end orchestration. First-generation CI typically provided prepackaged kits of server, network and storage and single-vendor support. Second-generation CI added API offload from server to storage CPU, advanced storage technologies, and scale-up and scale-out features.

[callout]

Moving directly from 1st-gen CI to UCP with Unified Compute Platform Director will likely reduce unit costs between 20 and 30%.

Moving from 2nd-gen to UCP with Unified Compute Platform Director shows reductions up to 15%.

While each jump in technology evolution produces significant savings opportunities, the percentage goes down because many of the most costly events have already been mitigated in the previous phase.

Case Study: Insurance Company Realizes Savings Over US$6.6 Million With UCP for Oracle Database

Hitachi Data Systems commissioned independent firm Forrester Consulting to conduct a Total Economics Impact (TEI) study on the potential ROI for enterprises deploying Hitachi UCP for Oracle Database. Forrester interviewed an existing customer who implemented UCP for Oracle Database: The results are based on 1 year of operation in the customer's production environment.

Methodology

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

The TEI methodology consists of 4 components to evaluate investment value.

- *Benefits*: the value delivered to the user organization by the product or project.
- *Costs*: the investment required to capture the benefits, including all labor, materials, incremental and ongoing associated with the solution.
- *Flexibility.* the strategic benefit that can be obtained for future additional investment by building on top of the initial investment already made.
- *Risks*. The measure the uncertainty of benefit and cost estimates of the investment. Uncertainty is measured in 2 ways: via the likelihood that cost and benefit estimates will meet original projections and the likelihood that estimates will be measured and tracked over time.

Customer

The customer in this TEI analysis is a leading, diverse global insurance company, with 150 locations, CHF$3.4 billion in annual revenue, and 4,300 employees, of which 400 are in the IT department. The insurance company is customer-focused and operates mostly as a decentralized culture.

Challenge

The company relies on Oracle Database environments to manage varied database workloads across the enterprise, including a data warehouse. The Oracle Databases were being run on a Unix platform with non-Oracle hardware. As this environment began to show signs of age and performance decline, the company CEO presented a vision for modernizing IT to answer the business need over the next 5 years. Part of his business-defined vision centered on a better decision-making platform that would require a new data warehouse and very fast infrastructure.

Solution

The company selected Hitachi UCP for Oracle Database for its price/performance value and to ensure consistently high and scalable performance for optimizing data warehousing and business intelligence.

"The Hitachi UCP for Oracle was the only one out of 5 converged platforms to hit all our targets (for query times in a comparative test)…and while not the cheapest, it provided the best economic value by far."

—Head of business architecture, Swiss insurance company

Results

The benefits and economic impact for the customer have been impressive. The Forrester TEI study revealed benefits of CHF$13 million per years versus costs of CHF$6.4 million, for a net present value (NPV) of over CHF$6.6 million. The results were also risk-adjusted over a 3-year period (see Table 2.)

Table 2. Financial Summary Showing 3-Year, Risk-Adjusted Results With Hitachi Unified Compute Platform for Oracle Database

Return on Investment (ROI)	Net Present Value (NPV)	PAYBACK
103%	CHF$6,610,839.00	2.1 months

Benefits

The customer noted the following risk-adjusted benefits:

- *Administrative efficiency* – significant reduction in IT effort required to maintain and manage, as compared to previous environment.
- *Business productivity* – increased line of business efficiencies and production, as compared to previous environment.
- *Asset cost avoidance* – savings gained by deploying Hitachi UCP over an alternative, higher cost CI solution.

Costs

The customer experienced the following risk-adjusted costs:

- *Hardware purchase* – the cost of purchasing the Hitachi UCP solution.
- *Software cost* – the annual maintenance cost for Oracle Database licenses.
- *Additional* licenses – incremental cost for any additional Oracle Database licenses as needed.
- *Lifecycle opex* – labor time and effort that contributes to initial and ongoing operation of the UCP solution, such as internal planning, implementation and ongoing maintenance.

Final Notes

As savvy organizations embark on deriving the most from Business-Defined IT initiatives, it is critical to fully understand the costs and benefits of new technologies and the best ways to manage them. IT Economics from Hitachi Data Systems has investigated the potential cost savings of various improved states of managing technology, from RISC-based and DIY through early generations of CI to Hitachi Unified Compute Platform with end-to-end orchestration. For organizations intent on evolving how their technology is managed by deploying UCP, the results are broader economic gains and deeper business insights.

For more information on Hitachi UCP solution family, please visit: http://www.hds.com/products/hitachi-unified-compute-platform/

For more information on Business-Defined IT, please visit:

http://www.hds.com/solutions/it-strategies/business-defined-it.html?WT.ac=us_mg_sol_businssdf

To learn more about how IT Economics can assist with capitalizing on technology investments, please visit:
http://www.hds.com/solutions/it-strategies/it-economics/

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