



Inside Track Executive Brief



HCI solutions & SAP HANA

Modern systems for modern software

in association with



and



Introduction

Not so long ago, heavyweight enterprise software from the likes of SAP lived in a different world from cloud-like hyper-converged infrastructure (HCI). Enterprise software was regarded as monolithic, and ran on large servers or mainframes, while HCI was a vehicle for operating private clouds or running multiple client-server type applications in virtualized form.

All that is changing following SAP's transformational decisions, first to build its own in-memory database called HANA, and then to rebuild its data warehouse and ERP applications to use HANA as their essential foundation. Not only does HANA offer operational advantages, such as the ability for transactional and analytical applications to share the same platform, saving cost, complexity and time, but it is a much more modern software architecture.

This makes HANA well suited to the fast-growing world of HCI and cloud, a world in which technical resources are decoupled from hardware and are instead abstracted (or virtualized) and defined in software. By removing the need to dedicate specific hardware to each application this abstraction can cut costs, especially in the case of applications that need to be highly available. In addition, managing an application – for example scaling it up or down, or moving it to a new home – is now done in software. This means it is simpler and faster and can be automated.

In this paper, we discuss how and why these two worlds are coming together, the need for validated HANA-on-HCI solutions, and what else SAP and HCI practitioners need to know in order to work together.

Abstraction, information and interfaces

Information technology is changing, both technically and philosophically, and both HCI and HANA are examples of that change. In the new model, the monolithic applications and software suites of yesteryear give way to more granular and flexible architectures.

The concepts here are not new: software has long been designed and built in modular form, with reusable elements kept in libraries, and with applications able to act as 'services' for other applications. What's new are the degrees of abstraction, granularity and standardization. They allow us to regard modern applications in many ways as orchestration engines that draw upon libraries of re-usable functions or microservices, and use standard APIs (application programming interfaces) to communicate.

Similar concepts have become mainstream on the operational side too. A key factor here is the convergence of computing, networking and storage into a single abstracted and automated platform, exemplified by HCI and the public cloud, as we will discuss later. Then there is the shift to service-based delivery models at every layer, for example Software-as-a-Service and Platform-as-a-Service, SaaS and PaaS, and of

course container technology. Between them, these concepts provide a flexible and standardized infrastructure well suited to operating these application architectures.

The in-memory imperative

HANA's big advantage over traditional database architectures is its performance, which in turn brings simplicity and efficiency. For example, the speed of operating in-memory means you can use the same database for both operational transactions and analytics, which can eliminate the need for a separate data warehouse.

Fast response times also mean that HANA no longer needs many of the indexes and other supporting data structures required by traditional database platforms. SAP has claimed that all this can reduce your data footprint by as much as 90% or even 95%.

An example of how this offers real opportunities to SAP users is S/4HANA, the current version of SAP Business Suite that runs only on HANA. Where the previous Business Suite generations had a classic three-tier structure of client, server and database, S/4HANA is very different. Although packaged as a single product, S/4HANA is composed of multiple modules or building blocks. Different modules can run in different places or can be assembled into different platforms to address specific functional requirements.

The difference is more than just technical, it is philosophical too. That's because HANA is modular and is effectively cloud-native. One advantage of this is that it can realistically be run on modern virtualized and abstracted hardware architectures.

In particular, that means the likes of HCI – integrated and software-defined systems where the key elements of compute, storage and networking can all run on the same server (or cluster) in virtualized form. In effect, HCI is a software-defined data center (SDDC) in a box, and as such can also be operated as if it were a private cloud.

The need for flexibility and scalability

Most HANA installations will require multiple instances of the software. Not only might there be multiple production setups – for different operating groups or divisions within the organization, say, or for different geographies – but there will also typically be multiple test and development systems alongside those production systems. To make things even more complex, those secondary instances are likely to be refreshed fairly frequently, for example as developers work on them.

This kind of “as-a-Service” flexibility is one of the things that HCI and the cloud are good at. Entire systems can be created from standard pre-configured templates, backed up, or even replicated relatively easily.

Additional demands for flexibility and scale will inevitably come from wider usage of the system or systems. One of the advantages of providing dynamic access to a responsive data source of this kind is of course that more people will use it, and for

more purposes. You can expect therefore that your ERP or data warehouse will probably have a bigger and broader user-base than in the past, and it should be specified and scaled accordingly.

Unlocking the benefits of HCI

Like any virtualization system, HCI uses layers of abstraction to present the physical resources available to it as pools of software-defined logical resources. However, it differs from most previous examples in two notable ways. First, it is designed to deliver all three logical resource pools (compute, storage and networking) from a single server or cluster – they can even share the same processor.

Second, the management software in HCI systems can optionally include a high degree of orchestration and automation. In this respect HCI can be thought of as a vending machine for VMs, or as a ready-made SDDC (software-defined data center).

That orchestration and automation also makes HCI a good fit for modern services-based software such as HANA. Resources and services can be added or removed automatically as demands vary, allowing businesses to enjoy cloud-like economics. The latest HCI implementations also allow resources to be added from the public cloud if the local pools are insufficient.

HCI versus cloud, or HCI plus cloud?

While the public cloud can be a very effective choice for some types of hosting, it is less appropriate for others. For example, it can be a good location for hosting an application which experiences unpredictable or intermittent spikes in demand. The inherent elasticity of the cloud allows those spikes to be catered for, without the need to provide that maximum-load capability all the time. Similarly, it can be a good choice for applications whose expected lifespan is short or not known.

On the other hand, it may not be the best location for predictable applications or those with long lifespans – in this case, it can be more cost-effective to make a one-time investment in the necessary hardware, rather than pay ongoing usage and contingency fees. This of course is where in-house HCI can score, providing cloud-like flexibility with a choice of charging models.

The solution for some – perhaps many – users will of course be to combine the two into a public/private or hybrid cloud. Long-lived instances could reside locally on cost-effective HCI, say, with the option to draw extra resources from the cloud to meet demand peaks, while short-lived test systems might run exclusively in the cloud.

For others, especially those with relatively predictable needs for ERP, data warehousing and so on, HCI will probably be the primary solution. Its flexibility, thanks to that abstraction layer converting the underlying hardware into pools of generic ‘resource’, means there is no need for purpose-built or dedicated hardware platforms,

each with its own supply of paid-for but underutilized resource. Instead, the HCI management software builds an appropriately-resourced platform in software.

It also means that multiple instances can safely be consolidated onto a single infrastructure – once the latter has been specified, designed and sized for this class of application, of course. Indeed, access to that application-specific platform expertise, either from within your own organization or from your systems partner, will be crucial to the success of a HANA-on-HCI project.

Checks and verifications

SAP has a certification scheme for HCI solutions that meet its HANA key performance indicators (KPIs), and which it will therefore support HANA on. A [list of SAP-certified HCI systems](#) can be found online.

More generally, HCI should work well as a host for HANA in many cases, but of course there may be use cases where it is not appropriate. HCI systems have upper limits on the amount of memory available to a hypervisor, for instance, and while HANA is a modern and flexible application, there may be instances where another approach is needed. Again, this is an area where application-specific expertise is required, and where it is advisable to seek advice from an experienced systems partner.

In conclusion

Software change is inevitable, whether you are a data warehouse user looking to take advantage of in-memory database technology, or an SAP ERP customer being guided towards HANA as the essential foundation for the future. And with that change comes opportunity – not only to move to newer and more efficient local infrastructure that is less costly to own and operate, but also to adopt more flexible, agile and cloud-friendly ways of working.

Similarly, for anyone already operating HCI systems, don't assume that 'enterprise applications' are beyond your remit. As software developers use modern techniques such as virtualization, containers and microservices to 'cloudify' their once-heavyweight applications, that process also opens the door for those same apps to be operated on cloud-like platforms locally.

Roll all of this together and we can see the potential for synergy. HCI can bring significantly simpler HANA infrastructure and storage management, plus elastic scalability with predictable performance and built-in high availability. Finally, because modern applications such as HANA are already cloud-like, adopting HCI can simplify a subsequent move to a hybrid or multi-cloud mode of operation.

About Freeform Dynamics

Freeform Dynamics is an IT industry analyst firm. Through our research and insights, we help busy IT and business professionals get up to speed on the latest technology developments and make better-informed investment decisions.

For more information, and access to our library of free research, please visit www.freeformdynamics.com or follow us on Twitter @FreeformCentral.

About Fujitsu

Fujitsu is the leading Japanese information and communication technology (ICT) company offering a full range of technology products, solutions and services. Approximately 155,000 Fujitsu people support customers in more than 100 countries. We use our experience and the power of ICT to shape the future of society with our customers.

For more information, please visit www.fujitsu.com.

About VMware

VMware software powers the world's complex digital infrastructure. The company's compute, cloud, mobility, networking and security offerings provide a dynamic and efficient digital foundation to over 500,000 customers globally, aided by an ecosystem of 75,000 partners. Headquartered in Palo Alto, California, this year VMware celebrates twenty years of breakthrough innovation benefiting business and society.

For more information, please visit www.vmware.com/company.html.

Terms of Use

This document is Copyright 2019 Freeform Dynamics Ltd. It may be freely duplicated and distributed in its entirety on an individual one to one basis, either electronically or in hard copy form. It may not, however, be disassembled or modified in any way as part of the duplication process. Hosting of the entire report for download and/or mass distribution by any means is prohibited unless express permission is obtained from Freeform Dynamics Ltd or Fujitsu. The contents contained herein are provided for your general information and use only, and neither Freeform Dynamics Ltd nor any third party provide any warranty or guarantee as to its suitability for any particular purpose.