The Future of Client Computing in the Financial Services Industry

Situation Overview

The Financial Services Industry (FSI) is an advanced adopter of new IT infrastructure technology. A major challenge in that vertical is about delivering high-power tools to end users to enhance their productivity, while at the same time minimising the booming security risks to customer data and intellectual property. This document takes a critical look at underlying infrastructure. It will focus on giving end users a comprehensive understanding of the pros and cons between traditional desktops, Virtual Client Computing (VCC) or Virtual Desktop Infrastructure (VDI), and Hosted Desktop Infrastructure (HDI) environments.

Based on existing research and on an in-depth analysis of fifty key items impacting end-client computing delivery, IDC believes that IT buyers in the financial services industry should carefully consider HDI solutions as a promising option. The technology is appealing and can prove more useful than other alternatives, especially in cases where high level of performance needs to be guaranteed, while keeping a management of all endpoints.

IDC recommends end users to start with their current VDI or traditional desktop environments, and identify if their security and performance capacities are being fulfilled, as HDI can provide the same level performance as traditional under the desk personal computers (PCs) with the added benefit of simplified central management.

FSI Infrastructure Needs

The need to implement new rapid scaling applications and workloads is forcing organisations to reconsider their current infrastructure. CTOs in the FSI are under extreme pressure to find solutions that meet many requirements. This document identifies five key aspects that CIOs consider when selecting infrastructure to deal with future demands in the FSI.

- **Security**: The frequency, scale, and sophistication of cyber-attacks is a major area of concern. Unpatched systems and applications are a prime target for malware providers. Protecting applications and data against attack is now a prime business concern as new data privacy regulations are poised to impose large penalties on organisations that fall prey to successful cyber-attacks. A centralised infrastructure can minimise the risk of compromise because it can be patched quickly and easily to reduce the windows of vulnerability, and can minimise the threat surface by storing all

The world is changing, a trend that is being driven by the exponential growth in data, as well as organisations' need to process this data quickly to gain business insights and market advantage, while carefully managing the total cost of ownership (TCO) of infrastructures.

data in a safe backend, cutting out the risk of using unmanaged devices such as USB sticks that can spread malware.

- **Business Continuity:** Financial sector operators regulated by authorities such as SEC and FCS are mandated to ensure operational readiness in a disaster recovery situation. In environments where data is sitting on PC devices, this requires IT departments to set up a dedicated work area with extra failover measures. This can quickly become costly and can be avoided by centralising data storage in the datacentre and applying high availability techniques there.

- **Cost saving**: Managing TCO is a key driving factor for technologies such as cloud computing and VCC. A centralised system of record that is distributed to all endpoints automatically reduces the need to extended investment of personnel when patching, rolling out new applications and workloads, amending security protocols, and many other tasks.

- **Performance**: The ability of the underlying infrastructure in the FSI market to deliver high levels of performance is a necessity, as many workers in the FSI are both time and latency sensitive. Power users such as traders and financial advisors have to deal with increasingly heavy applications running client side; demanding spreadsheets with complex market simulations and risk models task the CPU, while videos, multiple newsfeeds such as Bloomberg, and data visualisation tools such as Tableau challenge the graphics capabilities. On top of that, it is now common practice for regular information workers to operate two or more displays at the same time and the move to 4K displays is ramping up. Running those applications in a vanilla Virtual Desktop Infrastructure is often not feasible due to performance inconsistency. This often forces a company back to square one — a distributed, unmanaged PC or workstation environment.

- **Simplicity**: The ability to quickly, efficiently, and accurately manage, scale, and patch the IT environment is central to the FSI market. As the IT environment is central to FSI business operations, the inability to react quickly to changing demands or requirements has a direct impact on the success of the organisation. Infrastructure that reduces management complexity drastically reduces time to market and overall business outcomes.

The Need for a New Approach

The enterprise infrastructure market is currently undergoing major changes that are only predicted to increase in the future. One of the greatest concerns is security, as seen in Figure 1. Large amounts of time and resources are invested to ensure compliance with many of the national, regional, or industry regulations. This, however, is limiting the amount of focus on implementing new workloads and applications that can provide organisations with a competitive edge in the marketplace. IDC believes that infrastructure that allows the management of an improved and simplified control over security will not only help the organisation comply with new regulations but also offer organisations a more competitive

stance in the market; new applications and workloads will only become more valuable as organisations need to deal with the ever-increasing amounts of data, regulations, and data protection laws. This is a trend that is being felt by all industries, but particularly FSI.
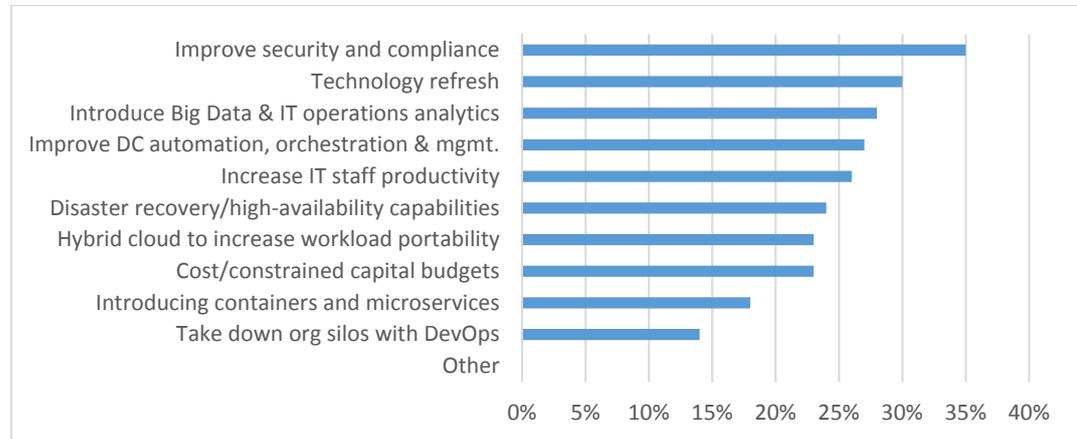
Figure 1
Datacentre Key Priorities

Figure source: IDC EMEA — Datacentre Survey 2017, n=640

The FSI industry still relies heavily on individual desktops, a system that although tried and tested, does not offer the industry the mobility, security, and simplicity that other solutions do. Efforts to virtualise the client device space have been only partly successful, due to reasons analysed in the next chapter.

Key Challenges to Legacy Virtual Client Computing Infrastructure

The majority of VDI today is based on an amalgamation of storage, compute, and networking that is combined into virtual resource pools, normally enabled by a hypervisor, that are then divided up into the required number of virtual desktops. This legacy approach to VCC has many drawbacks, including.

- **Latency:** The single most common factor affecting effective VDI deployments. This is a factor that can be mitigated, but it is a time-consuming and labour-intensive temporary solution. Latency is usually a function of ineffective provisioning of the underlying infrastructure, where an unexpected increase in user activity can topple previously well-provisioned environments.

- **Noisy Neighbours**: As these virtual machines are utilising pooled resources, a spike in memory requirements from one or more users around a single resource will have an impact on the remaining virtual machines, resulting in a deficient performance.

- **Over Provisioning**: An issue that is very common in VDI deployments is an over investment in the underlying infrastructure as a means of reducing latency and the effects of noisy neighbours. However, this aspect will have a direct impact on the TCO, as additional unutilised resources are purchased.

Reducing Latency on legacy VCC infrastructure is a time-consuming and labour-intensive activity that isn't a permanent solution.

- **Cost**: Legacy VDI deployments not only require large amounts of software, hardware, and network capacity, but also require a large investment of time from industry specialists. Although legacy VDI infrastructure will reduce overall power consumption, additional software licensing fees needed for Bring Your Own Device (BOYD), thin clients, and the effects of over or under provisioning can have a larger impact on TCO in the long run.

The Intrinsic Benefits of HDI

HPE's hosted desktop infrastructure (HDI) offers solutions to many other client computing service delivery issues. Key to HDI's approach is its ability to consistently and effectively provision each virtual desktop with the required compute, storage, and graphical resources. The ability to correctly provision is the single most effective means to provide high levels of performance, and eliminates the effects of noisy neighbours.

Additionally, HDI removes the necessity for the hypervisor and its accompanying layer of implementation complexity, and cost. The vast majority of organisations that have implemented VCC environments raise the issue of latency and poor performance of the graphical interface. HDI overcomes this issue by pre-provisioning a dedicated GPU for each user

HDI avoids many of VDI's more common issues by assigning each individual virtual desktop its own dedicated server node that supports both compute and graphics processing.

Many of the advantages of HDI have been carried over from the legacy environments of VDI. However, HPE's HDI offers end-users additional value propositions that need to be further considered as their impact is notable. It is based on HPE's Moonshot Server chassis with a total of 45 cartridges, offered traditionally with two processing configurations one intel and the other AMD (which can support up to 180 users in a single chassis as each cartridge carries four SoC processors). HDI, however, has seen greater success with the Intel-based version that consist of a single Intel CPU, and an additional GPU processor per cartridge. HDI assigns each individual user its own dedicated node that supports both compute and graphics processing. A single HPE HDI chassis supports up to 180 information workers (AMD cartridges) or 45 power users (Intel cartridges). This hardware solution additionally includes the following more notable specifications.

- One Node One User approach

- Dedicated compute and graphics for each user

- Reduced complexity with no hypervisor layer or SAN storage

- Compute, storage, and networking in a single chassis

- Citrix XenDesktop shared Windows desktop images require no additional external storage or virtualisation layer

HPE's HDI approach is built on a two-processor computing option, Intel and AMD. AMD Opteron X2150 AP-based solutions are targeted at mid-performance workloads to support a large number of users, thanks to the Systems on a Chip density. In the case of Intel E3 solutions, higher performance workloads can be supported, but consolidation ratios are lower. The latest Intel E3 chipsets include Intel's Software Guard Extensions (SGX). This technology that allows the creation of

enclaves within the memory to ensure selected date and code remains protected from disclosure or modification. This level of protection offers the FSI many benefits, such as reductions in the trusted computing base required for key applications and better ransomware protection.

Below are some of the key defining advantages of HDI.

Many advantages of HDI come from legacy environments of VDI, but HDI offers end users additional value propositions that need to be further considered as their impact is notable

- **Supplied as a solution from an established vendor:** HDI is delivered as a solution offering, preconfigured and prechecked. End users are not required to problem solve with multiple parties, as they have a single point of contact for technical support. HPE offers a global footprint, while ensuring a local contact point for all stages of the solutions life cycle, where end users can tap into an established knowledge base located in their time zone.

- **Total Cost of Ownership (TCO):** HPE's systems targeting HDI has been engineered to deliver high levels of performance at reduced power levels, reducing operational expenditure (OPEX). Selecting Citrix XenDesktop enables HDI to deliver to any endpoint device, including BYOD and thin clients, without incurring additional licensing fees. Lastly, linking virtual machines to server nodes reduces time to market, not only giving the organisation a competitive edge in the market place, but also providing users with high levels of performance.

- **Definable Scalability:** A key defining factor of HDI is the direct link between virtual client instances and CPUs. This single attribute improves IT professionals' ability to accurately purchase the correct amount of hardware, eliminating costly over provisioning, while ensuring high levels of performance for all end users, without the effects of noisy neighbours.

- **Fixed Performance:** A factor that separates most legacy VCC infrastructure from HDI, is HDI's inclusion of a dedicated GPU for each user. By doing this, HDI ensures high levels of performance against which legacy architecture struggles to compete.

Deciding if HDI is Right for You

IDC has developed a decision matrix for evaluating PCs, traditional 3-tier VDI, and Hyperconverged VDI against HDI. The below matrix scores these infrastructures by the ranking of 50 aspects within the following 5 key areas; Security, Simplicity, Mobility, Performance, Cost saving. These findings are based on current market insights and research conducted on current opinions held by market experts.
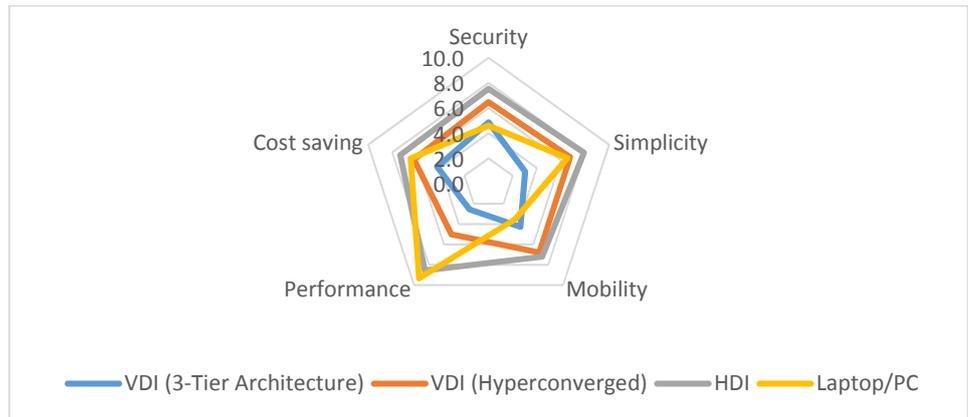
Figure 2
Infrastructure Opinion Matrix

Figure source: IDC Primary Research, October 2017

This matrix provides the reader with a visual representation of the most common infrastructure options in comparison to HDI. IT looks at 50 key scenarios an end-user would be faced with. A weighted score was defined by IDC market experts' opinions on the solutions' ability to fulfil expectations within the 5 categories seen in Figure 2. This matrix should be used as a rough guide, where end users can match their needs to one, or many of the five categories identified, as a means of comparison or for future infrastructure planning purposes.

Visible outliers can be found in performance, where market experts identified the performance gains users would experience with improved provisioning and dedicated GPU resources. Other outliers could be found in mobility, specifically the support of multiple devices, which would be a limiting factor with some virtualisation software and licensing fees. Simplicity also identified anomalies where HDI scored highly on delivering greater value in areas such as local support, managing rollouts, and out of the box functionality.

As can be seen, while VDI and HDI offer similar benefits when it comes to Security and Privacy and Mobility, when it comes to Performance, Cost Efficiency and Adaptability HDI should be given serious consideration for providing the foundation of your Virtual Client Compute capability.

Conclusion

This document has provided a critical look at the array of underlying infrastructure supporting VCC, and accompanying weaknesses and strengths. Key aspects when considering the most suitable infrastructure for VCC environments have been discussed, as well as the impact these aspects will have on an organisation's competitive stance. HDI increases productivity and time to market, while delivering scalability, security, cost savings, performance, and simplicity.

IDC believes that a stronger link between the underlying infrastructure in VCC environments allows for increased visibility and control of the overall IT environment. This is an aspect that should be considered carefully as increases in simplicity not only reduce OPEX related to personnel, but also revenue generation by reducing time to market.

About IDC

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