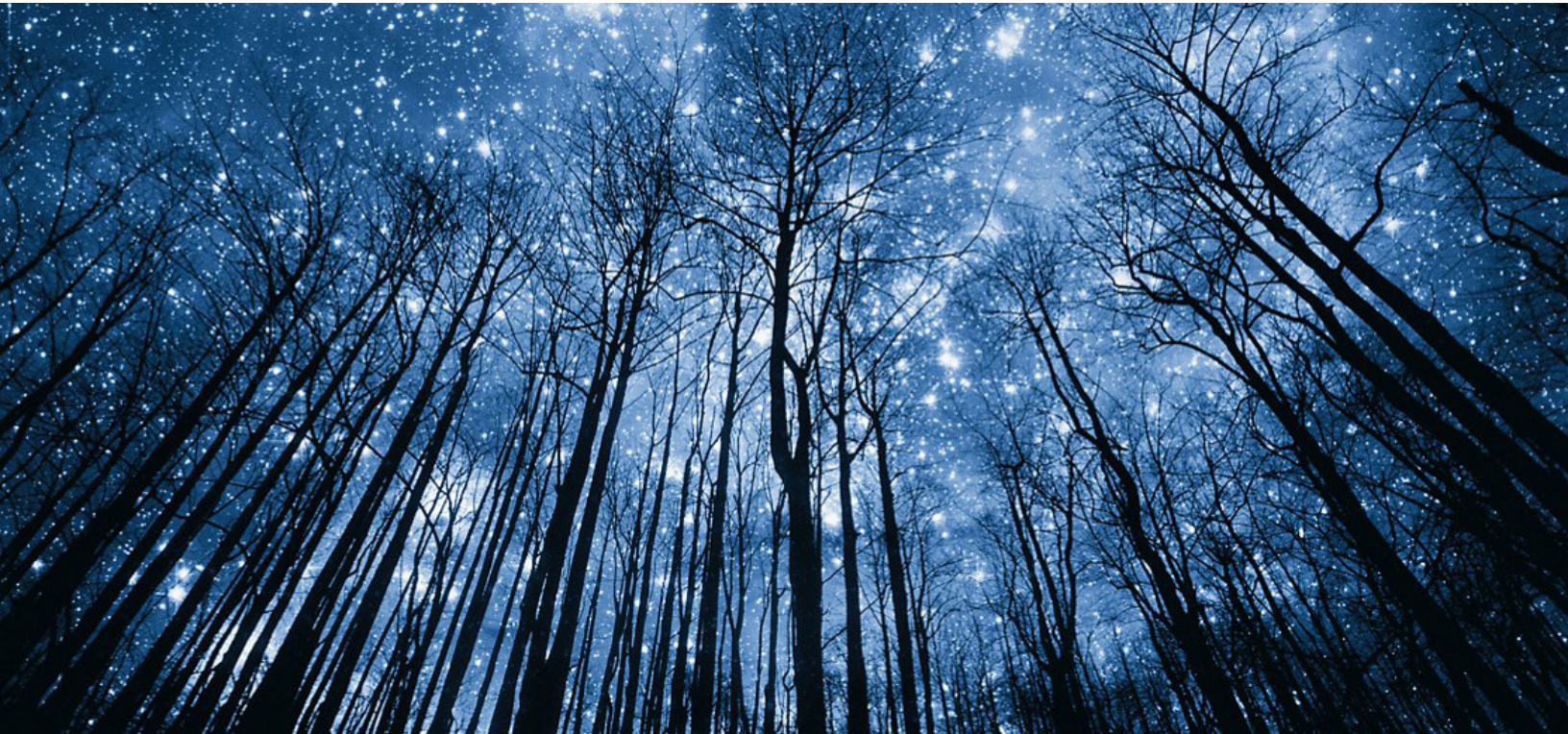


CLOUD REPATRIATION: WHAT, WHEN, AND WHY?



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ABSTRACT

CLOUD REPARTIRATION: WHAT, WHEN, AND WHY?

In today's digital age, there is a lot of demand for accelerated services and the fast rollout of applications. As businesses transform to adapt to the changing consumer climate and pattern of buying, more and more organizations are looking to adopt cloud migration strategies. It is safe to say that a large section of technology leaders are focusing on a cloud-first approach in their environment to prioritize advanced services that can replace legacy IT systems. Over the past few decades, on-premises infrastructure has been the most sought-after business offering. Why has that been the case? Well, stakeholders could solve their organizational needs and have full control over their infrastructure at the same time. They are also accountable for their data, which means added complexity in operations and management.

This changed with the introduction of the term "cloud computing" in the late 1990s (although organizations began describing this new paradigm around 2006). It defined a shift in the IT industry as remote data centers, or the cloud, became a nest to host more compute memory, applications, and processing power. The popularity of cloud computing can be attributed to many businesses, from start-ups to Fortune 500 organizations. Perhaps the plethora of options available to adopt was what gave birth to Multicloud, and it soon became a massive game changer. It is fair to say that this is a relevant trend because operations have increasingly become remote today, forcing companies to depend on cloud services and applications. The benefits of the cloud are numerous, but it is not a one-way journey. The real question is, for how many organizations is it working?

In recent days, a popular file hosting company decided to shift back to an on-prem setup from the public cloud, posing the question: How much ROI can you achieve with cloud migration? Cloud adopters have increased, given the current IT circumstances, but we cannot ignore a few cloud repatriation cases. This phenomenon is simply defined as the process of moving your data, applications, and workloads from the public cloud to on-premises local infrastructure. It is still debatable as to why certain stakeholders decide to switch back to an on-prem or a hybrid approach. We can postulate that a few factors contributing to this shift would be the challenges with data regulation, cost constraints, or the reality of cloud deployment being different from what was promised. No matter what the real reason is, cloud repatriation is happening in a few pockets of our digitally transforming IT world. Its consideration is as important as examining the benefits of the cloud.

This article explores some of the challenges faced by stakeholders while adopting cloud strategies for their businesses. The article will help stakeholders understand the phenomenon of cloud repatriation and how to be better prepared for what is yet to come.

INTRODUCTION

There are many organizations that are still going back and forth with their decision to move their applications to the cloud. For bigger organizations with a substantially matured IT team, experience and budget seem to be key influencers in that decision, but for many other small businesses, it becomes hard to make that judgment. One might argue that cloud repatriation isn't as common in today's digital age and that it makes more sense to drill into highly successful multi-cloud adoption business cases. But the truth is that catering to every customer's need has become a vital aspect of an organization's customer experience promise.

In the year 2018, Morgan Stanley released a financial report that predicted substantial revenue growth for hardware while recognizing a massive shift to running applications on the cloud. Even though contradictory, researchers found that the eventual slowdown of hardware sales was not related to the fact that organizations were moving to the public cloud but rather due to the struggle of companies to understand cloud migration. Organizations have put their hardware purchases on hold in the past to understand what percentage of these workloads should be migrated and how to optimally achieve that. And today, the struggle seemingly continues as companies have started rethinking their approach to cloud migration, adjusting some decisions made during the initial planning process in their journey.

It is also not true that every tech giant that has adopted the cloud has reaped the expected benefits. It is good to keep in mind that deciding 'how' and 'when' to use the public cloud is more important than just doing an ROI assessment. Imagine your organization having a unique use case for storage: you deal with *exabytes* of data, and your customer base is growing annually at a rate of 5%. With such a huge scale to cater to, it might make more sense to build something from scratch as it would ensure better 'unit price' economics. Not only that, such a large-scale to store would require equivalent data security and reliability measures which would further add to the total cost. Hence building an environment from scratch and making sure that data security is established at every level would be a better functioning model for your organization to manage costs and reap benefits at the same time. It is also safe to say that there are very few companies that might require such vast scales to store their data, and hence one cannot find much about containing these huge ecosystems in any open-source communities. Customization is the best way forward, and that doesn't always mean turning to the cloud.

Cost is one of the major factors driving repatriation. If the assumed cost of operation is higher in the cloud, then bringing a few applications down or employing co-location is a better fit. As the costs of memory and disks continue to decline, it is changing the requirement to operate in the cloud.

An interesting customer use case is that of a craft brewing company that, in recent years, managed to migrate its core applications from the cloud to on-premise servers, where the key drivers were reduced costs and maintenance expenses. They had the advantage of housing talented and trained staff for maintaining on-premise equipment and, moreover, predictable costs when scaling was their key requirement.

Repatriation isn't happening just in the space of the public cloud. There are a few instances of this phenomenon in SaaS (Software as a Service) and co-location as well. Such cases give us a different perspective on the cloud journey for customers, keeping us informed that we need to be prepared for 'unclouding' as well.

CLOUD REPATRIATION

Cloud repatriation refers to the process of moving data, applications, or other resources that were previously hosted on a cloud computing platform back to an organization's on-premises data center or another private cloud environment. This can be a complex process that requires careful planning and consideration of a variety of factors.



Fig. 1 IT Infrastructure (Ref 3)

Cloud repatriation and migrations are unavoidable in a few cases. Organizations need to prepare themselves to be able to migrate their workloads between disparate systems and platforms, regardless of the location of their data: be it on the public cloud, private cloud, or on-premise data center. The problem mainly arises due to compatibility issues. For example, many cloud platforms have not been designed in such a way that they can integrate with other cloud platforms, let alone on-premise data centers. Adding that to the already existing complexity of IT infrastructure can make these dependencies even more difficult.

CHALLENGES TO ADOPTING CLOUD

Some common challenges faced by stakeholders while adopting cloud strategies for their businesses include the following:

- **Security concerns:** Ensuring the security of sensitive data in the cloud can be a major concern for many businesses.
- **Data privacy regulations:** Businesses may need to comply with various data privacy regulations, such as GDPR (General Data Protection Regulation), which can be challenging to navigate in a cloud environment.
- **Migration and integration:** Migrating existing systems and applications to the cloud and integrating them with new cloud-based services can be a complex and time-consuming process.
- **Vendor lock-in:** Businesses may become dependent on a single cloud vendor, making it difficult to switch to a different provider if needed.
- **Cost:** Cloud services can be expensive and difficult to budget for, especially for businesses with variable or unpredictable workloads.
- **Lack of internal expertise:** Businesses may lack internal expertise or knowledge regarding cloud deployment and management.
- **Lack of standardization:** Businesses may need more standardization when working with multiple cloud service providers, which can lead to confusion and inefficiencies.
- **Dependence on internet connectivity:** Cloud services depend on internet connectivity, which can cause difficulties during internet outages.
- **Limited control over infrastructure:** Businesses may need more control over the infrastructure of their cloud services, which can lead to difficulties in managing and troubleshooting issues.
- **Difficulty in measuring performance:** Businesses may need help to measure the performance of their cloud services, which can make it cumbersome to identify problems and optimize usage.

OUTCOMES OF REPATRIATION

While the Repatriation process can be complex and challenging, the outcomes of cloud repatriation can vary depending on the specific circumstances of the organization and the reasons for repatriation. Some potential outcomes include:

- **Improved security and compliance:** By bringing data and applications back in-house, organizations will be able to better control and secure sensitive information and comply with regulatory requirements.
- **Cost savings:** Moving data and applications back in-house may reduce costs associated with cloud services and providers.
- **Improved performance and reliability:** On-premises systems may offer better performance and reliability than cloud services, especially for workloads that require low latency or high data transfer speeds.
- **Greater flexibility and control:** Organizations may have greater flexibility and control over their infrastructure and IT systems when managed in-house as they can decide on how to better implement data management solutions.
- **Better disaster recovery and business continuity:** On-premises systems may be better suited for disaster recovery and business continuity planning by allowing organizations to store data and applications in multiple locations. This can help ensure that in the event of a disaster, such as a natural disaster or cyber-attack, that data and applications are still accessible and business operations can continue.
- **Limited scalability and access to the latest technology:** Organizations may need more scalability and access to the latest technology when they move back in-house, as they cannot have the same level of scalability as a public cloud environment.
- **Higher operational and maintenance costs:** Organizations may have to bear the higher operating cost, which includes the cost of electricity and cooling for on-premises infrastructure and maintenance costs for upgrading on-premises infrastructure, such as servers, storage, networking environment, etc.
- **Difficulties in adapting to the new infrastructure:** Businesses may need help in adapting to the new infrastructure. They may need to invest in new hardware and software and add additional costs for hiring and training skilled staff to manage and maintain on-premises or cloud environments.

CLOUD REPATRIATION IMPACT

The statistics below show how enterprises are moving workloads between IT environments to achieve that optimal balance and demonstrate the reality of cloud repatriation.

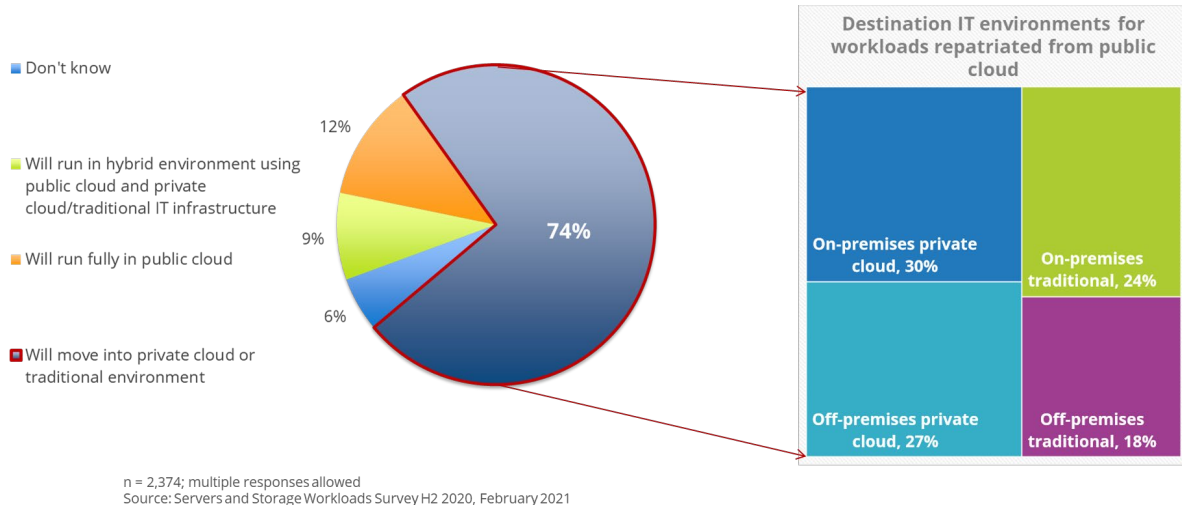
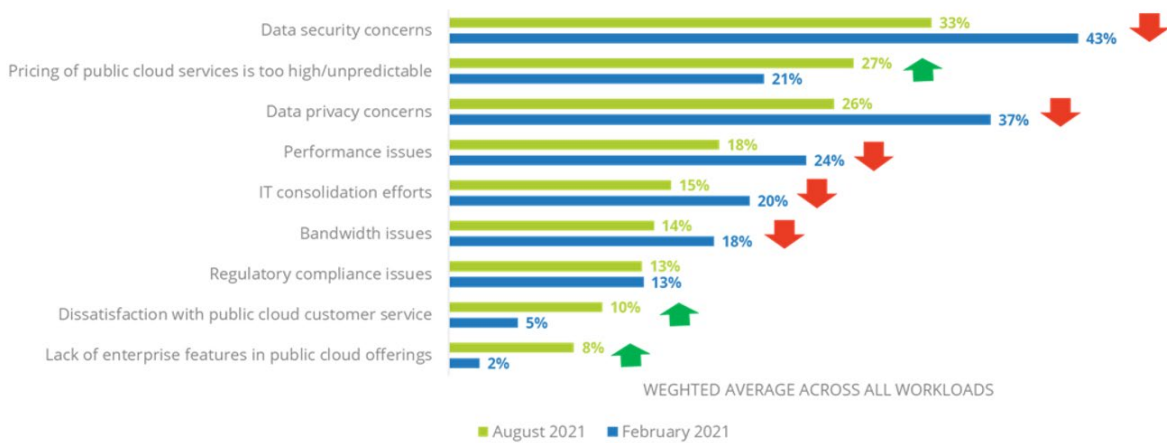


Fig. 2 Servers and Storage Workloads Survey H2 2020(Ref 1)

The above graph is from IDC's Servers and Storage Workloads Survey taken on February 20, 2021. According to the survey results, we understand that cloud repatriation is going to be around for a while. As you can see, back in 2021, 74% of enterprises polled that they might transition to a private cloud or traditional environment from the public cloud; out of that, 54% would be moving onto On-Premises private cloud or traditional environment, and the rest 46% would be moving to Off-Premises private cloud or traditional environment.

Repatriation is a stacked term; it could mean returning to company-owned data centers, which means returning to the traditional environment or simply migrating workloads to the private cloud. Cloud repatriation doesn't mean it has a negative effect on the organization; it can also be said that the enterprises may be rethinking their strategic values or just restructuring the workloads to function much better in the long term.



n = 2,325 (August 2021), n = 2,374 (February 2021); multiple responses allowed
 Source: Servers and Storage Workloads Survey H1 2021, August 2021; Servers and Storage Workloads Survey H2 2020, February 2021

Fig 3: Servers and Storage Workloads Survey H1 2021, August 2021(Ref 1)

The above graphs show the result of two surveys taken in the year 2021 in February and August by IDC.

As we can see, data security, pricing, and privacy concerns are the primary reasons driving stakeholders to go ahead with cloud repatriation.

If we analyze the graph further, we know that most organizations were more inclined towards repatriation due to operational reasons than functional components. Performance issues, IT consolidation efforts, and bandwidth issues are the next major primary concerns, followed by compliance issues, public cloud customer service, and a lack of cloud features.

So far, the problems that we have seen with enterprises currently facing lead us to understand that while organizations are looking for a shift from their current environment to a cloud-like model on-premises, they are experiencing a lot of adoption problems that might be due to operational difficulties or their expectations not being met correctly. The public cloud does have its own set of challenges, so stakeholders should be aware of all of them before adopting it in the first place. The upcoming section discusses some considerations to be made before moving to the cloud.

HOW TO AVOID UNCLOUDING?

Few things to keep in mind before adopting the cloud:

- Once you have adopted the cloud environment at your sites, moving the workloads away from the cloud would be a significant decision. Those who are yet to plan this might face a major setback. Repatriation can vary from large enterprises to small enterprises. Large enterprises may move back to the traditional on-premises setup they already have in place, while small businesses can migrate to a private cloud. These situations vary according to their IT needs.
- Try to understand the workloads running on the environment and based on that, refactor the workloads or the applications so that they can perform more efficiently in a cloud or non-cloud environment.
- Have a clear understanding of your organization's cloud adoption strategy and how it would benefit in the long term before committing to the cloud.
- Adopt a better migration strategy before moving to the cloud.
- Understand the security aspects of the cloud and see if your organization's norms (compliance requirements) abide by them.
- Before migrating to the cloud, a clear understanding of the cost model for workload placement is required.
 - Data Egress Cost: There is a considerable cost involved in downloading or having the data transferred over long distances; it varies from provider to provider.
 - Scalability Cost: There might be a situation where automatic scaling happens based on your use of resources, which again incurs additional charges.
 - Network Cost: Once you decide to shift to the cloud, some additional costs will be involved in the network traffic.
- A dedicated in-house team of skilled professionals who can look after the whole environment.

Your given set of applications or workloads will define if the cloud deployment model suffices your needs or if you need to look at an alternative cloud deployment model.

THE BALANCE

So far, cloud repatriation cases have been minimal to the extent that we can call it a small fish at sea. But we need to acknowledge that there are challenges for many organizations by hosting their entire workloads on the cloud. Another counter argument to this would be the fact that the public cloud is crucial to digital transformation. It also remains one of the best ways for any organization to scale a business in an accelerated time frame. So, what can organizations with repatriation concerns do?



Fig. 4 Finding the Balance

We have several consulting areas to explore within this scope, but an approach that is being acknowledged as a value-add to such enterprises is Hybrid: a combination of public and private, when leveraged for the right set of workloads and at opportune moments in a business lifecycle, could be advantageous. We cannot completely ignore the concerns of companies moving away from the cloud, nor can we say with proven evidence that moving to the cloud always and only gives you agility and a perfect infrastructure model to cater to your IT needs. Hence a middle ground is often seen as the only practical solution to optimize the performance of one's workload. Many a time, disillusionment around the idea of the public cloud and the subsequent push for repatriation comes from inefficient and misleading estimation of cost and associated savings. Not all workloads are suitable to be hosted on the public cloud either. The problem may not be the cloud itself but misplaced goals with respect to workload planning and its management. In the long run, there may come a time in an organization's IT journey to consider a hybrid approach to their workloads. After having considerable experience in navigating through a public cloud and on-prem infrastructure journey, depending on business priorities at that point in time, organizations should realize that they are significantly cloud mature and should consider workload optimizations.

Now let's take up a scenario where you are the main stakeholder of an organization. As deciding personnel of the tech team, you want to do an IT transformation for the company's betterment, like shifting to the public cloud to leverage the cloud features to keep up with newest technologies in the market. However, after a few months of deploying the public cloud model, you are facing the cloud challenges covered previously in the section.

It is crucial to understand that each organization can have a different set of issues, and one solution would not fit them all, but to better understand the scenario, let's take two of the most common challenges that enterprises nowadays face: data security and rising prices of public cloud. Now, as the head of the IT team, these two challenges would significantly affect your long-term strategy of IT transformation that is in place. So, to avoid that, one option would be to move the entire set of workloads back to an on-prem infrastructure. Here you can solve the aforementioned challenges, but it may not extend an opportunity for you to try the cloud version of the experience. Hence another alternative to pursue can be to segregate the workloads based on their criticality and then move half of your workload to the public cloud and the other half to the private cloud hosted on your own datacenter. By doing this, you can cut cost of your investment plan for the cloud, and you can retain full security control over the data as it is placed in a private cloud hosted on an on-premises infrastructure. This type of setup is called a Hybrid Cloud or the "BALANCE."

A hybrid cloud offers many benefits to the organization. It can help keep some of the workloads on-premises and move the rest to the cloud and help in controlling the workloads. At the same time, it provides a level of flexibility that may not be available in public clouds. By using a Hybrid cloud approach, organizations can migrate their workloads in a phased manner to minimize disruption and reduce the risk of losing data. Enterprises can keep data sitting on-premises regulated while still taking advantage of the cloud. They can also prioritize the workloads and move some of them on-prem; with this, the organization can improve the performance of those workloads that require lower latency and better security.

CONCLUSION

We have witnessed how the cloud has brought about a revolution in the field of storage, software and computing today. With many organizations investing efforts and funds to discover new horizons within and even above the cloud space, we can watch this space for more rapid innovation in the future. While the cloud has been making considerable noise, a few organizations in pockets may not be entirely satisfied in proceeding with this approach. Repatriation might be an unavoidable choice for many. The best way forward of course varies as a lot of aspects need to be taken into consideration: cost, viability, availability of experienced IT team, state of on-prem infrastructure, types of workloads, and even annual growth of data expected. Carefully evaluating the pros and cons of cloud adoption and traversing a strategic cloud journey should be key factors in determining any organization's successful digital transformation journey. Does that put repatriation in a bad light? Not at all. Repatriation needn't be negative. With increasing concerns, one can always take a step back and evaluate their strategic priorities, which are mandated by their business goals. This way, every organization taking time can gain better control and understanding of their environment. Having a suitable data migration strategy paired with minimal disruption is a great point to factor in too.

At the end of the day, repatriation and cloud adoption are both options that are pursued by various stakeholders around the world. In that sense, it is important to note that 'one being better than the other' isn't a fair concept. It is good to be aware of repatriation whilst keeping a close eye on your organization's cloud adoption needs. The bottom line is that every business requires a different approach and what works for one may not always work for another. In other words, one shoe doesn't fit all. For those keen to take a more balanced approach to handling their workloads, they can opt for a balancing act with the hybrid cloud strategy. But for a few others, refactoring application workloads so that they perform more efficiently when on the cloud could work better.

In conclusion, cloud repatriation can be a powerful move that organizations could utilize to take back control of their data and applications. For organizations that have embraced repatriations, they must realize that it was a strategic decision that had to be made to align their IT infrastructure with their business goals and regulations. No matter what the choice, it is worth remembering that the journey may be difficult, but the destination is always worth it.

REFERENCES

1. <https://dell.sharepoint.com/sites/latam-curators-cloud/Shared%20Documents/Repatriation%20Playbook%20v0.1.pptx?web=1>
2. <https://digicor.com.au/promo/5-reasons-for-on-prem-server>
3. [How To Build A Website Without Purchasing A Domain Through Bluehost | kili](#)
4. [7 Privacy Challenges in Cloud Computing - GeeksforGeeks](#)
5. [Top 5 Cloud Adoption Challenges Faced by Cloud Users \(daydigital.com\)](#)
6. [5 Reasons Cloud Repatriation Should Be Part of Digital Transformation \(itprotoday.com\)](#)
7. [What is Cloud Repatriation and When Does It Make Sense? | LightEdge](#)
8. [What Is Cloud Repatriation And Why Are Businesses Doing It? A Cloud Report | Mindsight](#)
9. [IT Hardware Gets a Second Life—and a Double Upgrade | Morgan Stanley](#)
10. [Myth or emerging trend? Cloud repatriation explained](#)
11. [Cloud repatriation: Five reasons to repatriate data from cloud](#)
12. [Cloud Repatriation Isn't Going Away — Here's How To Prepare | ActiveBatch By Redwood](#)
13. [5 times it's smart to pull apps back from the cloud | Network World](#)
14. <https://venturebeat.com/business/the-hybrid-cloud-balance-knowing-when-to-shift-between-public-and-private/>
15. <https://www.stackscale.com/blog/cloud-repatriation/>

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