Accelerating FinOps & Sustainable IT

with IBM Turbonomic Application Resource Management

Executive Summary

IT executives across industries face increasing pressure to maximize business value and ensure environmentally sustainable growth. As organizations seek to achieve greater agility, elasticity, and developer speed, they quickly learn that the complexity of managing hybrid and multicloud estates too often forces teams to over-allocate resources as a method of mitigating performance risks. Ever increasing end-user expectations when it comes to application performance put the tradeoff in starkly simply terms: allocate a bit (or a lot) more than you need, or risk losing customers and revenue due to poor digital experiences. Given our industry's soaring cloud expenditures it's obvious where the priorities lie.

The financial consequences have been painfully obvious for years. The environmental impact, however, has only more recently captured the attention of corporate boards and executives. Ultimately, cloud and IT operations teams must simultaneously navigate customer experience, budget, and sustainability goals.

In this white paper, we will discuss challenges that have brought IT to this state, as well as the differentiated approach of IBM Turbonomic Application Resource Management. For executives seeking a proven solution that helps IT organizations navigate these tradeoffs and support sustainable business value and continued growth, IBM Turbonomic offers a clear and proven path to achieving these goals through the optimization and automation of cloud and data center environments.

Digital transformation puts increasing pressure on IT to finally get the performance-cost challenge right

In recent years there has been significant growth in modern applications as more organizations digitally transform their business. According to IDC, by 2025, over 750 million new logical, cloud-native applications and services will be created.[1] While the touted benefits of speed and agility are more easily realized by application and developer teams, the complexity of managing distributed, microservice applications across a hybrid and multicloud mix of infrastructure has exacerbated the management challenge for cloud and IT teams. In fact, the complexity of modern applications was cited as one of the top challenges organizations face in maximizing business value in the cloud.[2] At the same time, end-user expectations for application performance and reliability have risen. According to IDC, higher expectations have made managing systems and applications to optimize end-user experience a major priority and now fast performance and 100% uptime are table stakes for digital business success.[3]

The consequences of not solving the performance versus cost problem are environmental as well as financial

The exponential growth of applications is happening in data centers where electricity makes up 70% of operating costs.[4] Whether you manage the data center or are consuming resources from a public cloud, the energy required to support these applications has an environmental impact. The sad reality is that organizations too often over-provision resources as a method of mitigating risk to application performance and the end-user experience. The extent of this waste cannot be understated. In 2022, organizations estimated that 32% of cloud spend was wasted, up from 30% in the year prior.[5] Such waste is also not exclusive to the cloud, as on-premises data centers typically operate at only 20%—40% utilization.[6] The rapid growth of digital applications and services shows no sign of slowing, which is why 80% of business leaders whose organizations have a sustainability strategy cited that their CIO plays a critical role.[7]

Engineer & Ops Priorities

1. SLO Adherence
2. Compliance
3. Cost

Finance Priorities

1. Cost
2. Accountability
3. Business Value

Everyone gets it—the sustainable business must consume cloud and IT resources efficiently

FinOps Aims to Cross-functionally Maximize Business Value
FinOps is an evolving cloud financial management discipline and cultural practice that enables organizations to get maximum business value by helping engineering, finance, technology, and business teams to collaborate on data-driven spending decisions.[8] The FinOps Foundation recognized that traditional operations in the cloud are too siloed in their approach to how cloud spend is managed and controlled. As we've previously noted, these (over)spending decisions have environmental implications.

Competing priorities across the IT organization make alignment between teams difficult: Finance Teams prioritize business value by knowing exactly what their organization is spending and are incentivized to be as accurate as possible when creating forecasts and cost models for operations in the cloud; whereas engineering, product, and operations teams look to achieve continuous service level objective adherence and deliver fast and high-quality services and products to the organization. Ultimately engineering, product, and operations teams aim to drive innovation without negatively impacting day-to-day performance and the end-user experience.

The FinOps Foundation aims to support the growing segment of FinOps practitioners who want to break down these silos, serving as the bridge between Finance and the engineering, product, and operations teams in IT. The FinOps practitioner is meant to engage all stakeholders and is responsible for identifying common pain points and KPIs to facilitate collaboration. Ultimately, the FinOps practitioner aims to unlock the promise of cloud computing and strives to create an efficient, profitable, and cost-effective cloud environment for their organizations.

Footnotes

1. IDC predicts that by 2025, over 750 million new logical applications will be created." Source: IDC: 750 Million New Logical Applications: More Background, Dec 2021. Doc #US48441921
2. IBM Turbonomic 2022 State of Multicloud Report
3. IDC Worldwide Application Performance Management Software Market Shares, 2020: Substantial Growth Amid Pandemic Disruptions. June 2021. Doc #US47989021
4. Barclays: Green Data Center: Beyond Net Zero
5. Flexera 2022 State of the Cloud Report
6. Data Center Efficiency Assessment
7. IBM Turbonomic 2022 State of Multicloud Report
8. State of FinOps Report

Beyond Cloud Cost Management
The FinOps discipline has rapidly grown in recent years and according to IDC, by 2023 80% of cloud users will establish a dedicated FinOps function to automate policy-driven observability and optimization of cloud resources to maximize value.[9] FinOps, as previously noted, is also an evolving discipline. Today the top FinOps capabilities listed by the community are cost allocation, data analysis and showback, managing anomalies, managing commitment-based discounts, and forecasting/budgeting, suggesting that for most organizations FinOps goals are nearly synonymous with managing cloud cost.[10] However, the aspirations of FinOps rightfully go beyond cloud cost management.

Maximizing Business Value Requires a Holistic Approach
To maximize business value in the cloud, organizations must implement systems and processes that look at the performance and efficiency of the environment holistically. To achieve the FinOps goals around maximizing business value, organizations cannot only focus on managing, allocating, and reporting costs. They must ensure that their cloud spend is money well spent—efficiently and sustainably supporting the dynamic resource demands of business applications.

The holistic approach of the FinOps discipline is reflected in the events and working groups organized by the community, including working groups focused on FinOps culture, sustainability, and automation.

Sustainability of the Cloud
The premise of the public cloud has always been that consuming cloud resources on-demand, as needed, supports agility and elasticity. IT's transformation from a CapEx to OpEx model has, in theory, financial benefits, as well as proven environmental benefits. The financial benefits, as we have discussed come with the significant caveat that cloud resources must be effectively managed and continuously adjusted to application demand to deliver the much-touted cloud elasticity (and therefore efficiency) benefits.

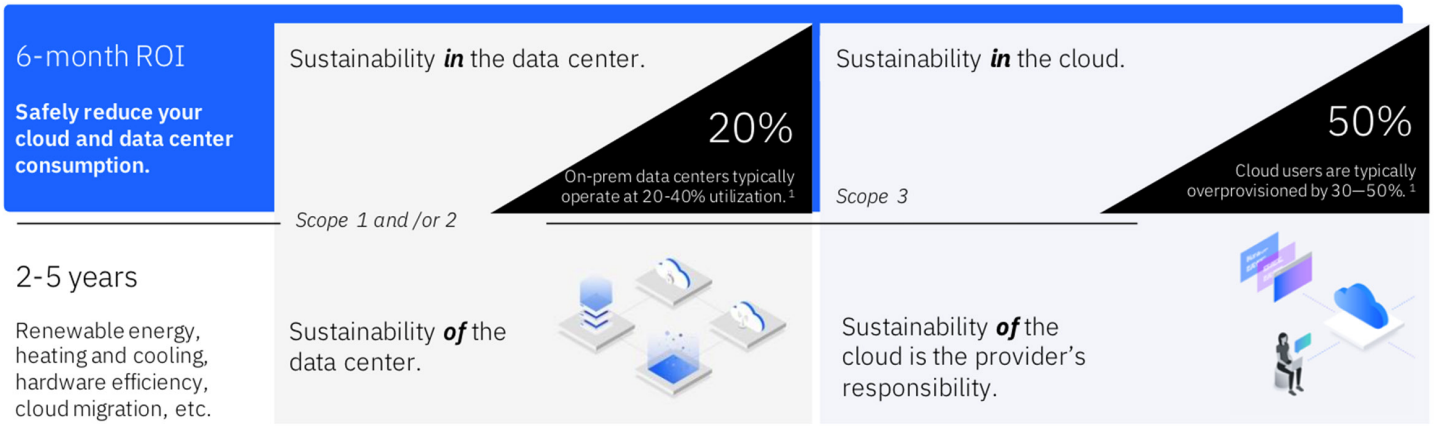
There are also significant environmental benefits to running workloads in the cloud versus on-premises. Compared to on-premises infrastructures, public cloud providers are inherently more efficient because they benefit from economies of scale. For example, a group of servers shared by thousands of applications is more efficient, both financially and environmentally, than thousands of servers in thousands of data centers.

In addition to the advantage of economies of scale, cloud providers are making major investments to improve data center energy efficiency and ensure cleaner energy sources. For example, Microsoft has invested in various methods of sustainable energy and cooling such as project Natick, an underwater data center that is powered by renewable energy and cooled by seawater.[11] Similarly, AWS has also invested in sustainable cooling methods for its data centers, as well as custom, renewable silicon for its hardware.[12] Furthermore, cloud providers have also prioritized improving the transparency of their environmental impact. In 2021, Microsoft announced its Microsoft's Cloud for Sustainability. This option allows ESG stakeholders to track carbon emissions from different applications and breaks it down into a variety of reports including a sustainability scoreboard that can track carbon emissions against organizational goals.[13] Google Cloud has also introduced greater data transparency by creating a region picker that allows operations teams to make ecologically informed decisions when deploying workloads.

A Shared Responsibility Model: Sustainability in the Cloud
In 2021 AWS announced a Sustainability Pillar that will "help organizations learn, measure, and improve their workloads using environmental best practices for cloud computing.[14] As part of this sustainability pillar, AWS created *The Shared Responsibility Model of Cloud Sustainability*. In this model, they state that AWS is responsible for the sustainability of the cloud, while AWS customers are responsible for sustainability in the cloud.[15] This position on how responsibilities should be delegated serves as a further testament to the critical need to solve the performance-cost challenge. This important distinction was also supported by the European Union in a recent study on the issue of growing energy consumption in Europe due to the expansion of cloud services. One of the findings states that the cloud has a distinct advantage over traditional data centers because resources are only used and paid for when they are needed (elasticity). Therefore, management software is critical for energy-efficient use of cloud services because they enable automated scaling based on demand and the allocation of cloud resources to applications.[16] For those managing hybrid environments, management software provides an immediate opportunity to safely reduce cloud and data center consumption.

Footnotes

9. IDC Survey Spotlight: What are the FinOps Challenges in Cloud Operations, and How are European Organizations Optimizing Cloud Costs Today? May 2022. Doc # EUR149137522
10. 2022 State of the FinOps Report
11. Microsoft Innovation Stories: Project Natick
12. The Sustainable Cloud: A Real Business Imperative, 2021, 451 Research
13. Microsoft Cloud for Sustainability
14. Sustainability Pillar for AWS Well-Architected Framework
15. Sustainability Pillar for AWS Well-Architected Framework
16. Energy-eficcient Cloud Computing Technologies and Policies for an Eco-friendly Cloud Market



Responsible consumption requires automation. Automation requires trust.

But why haven't we automated? When cloud and IT engineering and operations teams hesitate to automate cloud and data center optimization, it is because they feel they cannot trust the automation. Performance of the application is paramount, that is why IT exists. If there is any hint of risk to it, resourcing and cost optimization actions will not be automated.

Earning that trust is hard and it explains why "getting engineers to take action on cost optimization" and "enabling automation" are cited as key FinOps challenges among members of the FinOps community.[17] Current cloud management strategies can improve efficiency and reduce spend in isolated exercises, but their recommendations cannot be automated because they do not take into account the entire application stack and all the resource dependencies across the infrastructure it runs on.

Accelerate FinOps and sustainability goals today with automation you can trust.

The rapid growth and sheer scale of today's hybrid and multicloud environments requires a fundamentally new approach to automation when optimizing cloud and data center resources.

IBM Turbonomic ensures organizations no longer need to compromise between their cloud budget, sustainability imperatives, and delivering great digital experiences for their customers. Turbonomic software provides continuous optimization that you can automate, maximizing business value in the cloud while reducing cloud spend, as well as your carbon footprint.

IBM Turbonomic understands the resource relationships at every layer of the application stack and dynamically resources applications according to demand in real-time. IBM Turbonomic actions are trustworthy, and our automation can be operationalized, delivering measurable results as customers reduce cost and carbon footprint immediately and continuously. IBM Turbonomic can run in any environment.

Through a commissioned Total Economic Impact™ (TEI) study, Forrester Consulting projected that IBM Turbonomic Application Resource Management delivered a 471% return on investment for a composite organization, while paying for itself in less than six months. The study also projected that IBM Turbonomic can reduce cloud and data center consumption by 33% and save more than 50 hours of IT personnel time each month[18]. With IBM Turbonomic, IT executives can be leaders in FinOps and sustainability with transparency and measurable results.

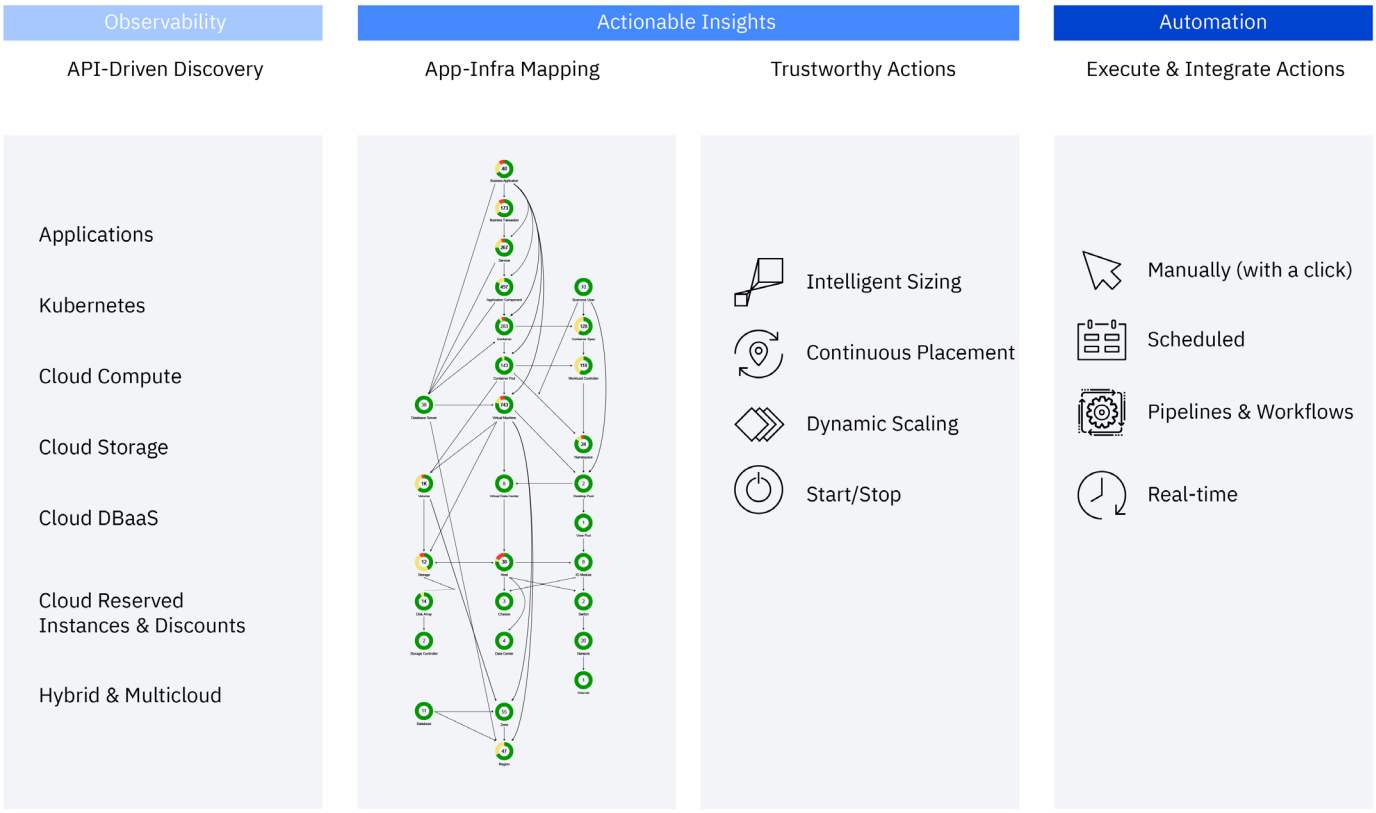
The benefits of trustworthy automation

For those championing automation and how it can help accelerate FinOps and sustainability goals mention these performance, cost, and sustainability benefits to create buy-in within your organization.

- Automate dynamic resourcing actions so that applications and the infrastructure they run on continuously manages to SLOs that correlate to business success.
- Operate at the lowest cost possible without having to worry about end-user experiences through automation that dynamically scales and resizes workloads to optimize resource consumption.
- Reduce consumption immediately and continuously by ensuring workloads only consume what they need to perform.

Footnotes

17. 2022 State of the FinOps Report
18. A Forrester Total Economic Impact™ of IBM Turbonomic Application Resource Management, 2022



Turn data into action: Through leveraging APIs IBM Turbonomic pulls data from your existing solutions and stitches together the application stack. By mapping out demand-vs-supply resource dependencies across the stack, the platform is able to continuously generate trustworthy resourcing actions that clients can automate and operationalize as suits their organization and business.

Performance Benefits

With IBM Turbonomic organizations can take a business-metric-based approach when implementing automation into their operations in the cloud, by identifying key performance indicators that directly correlate to customer experience, (ex. response time, transaction throughput, or custom metrics that make sense for your business) and setting actionable SLOs to those metrics. When such SLO policies are in place, engineering and operations teams can automate dynamic resourcing actions so that the applications and the infrastructure they run on continuously manages to that that SLO. Automating SLO adherence into pipelines, processes, and workflows ensures continuous ROI and unlocks true cloud elasticity while accounting for business constraints.

Cost Optimization

Traditional cost optimization tools provide recommendations and dashboards that can improve visibility and reduce cloud spend in isolated circumstances, but do not continuously optimize cost in hybrid and multicloud estates. Modern environments are always changing, and cost optimization actions must be executed continuously. Trustworthy automation that dynamically scales and resizes workloads is the only way to optimize cloud compute, storage, DBaaS, and Kubernetes continuously, to maximize efficiency by only consuming exactly what is needed to perform. IBM Turbonomic's trustworthy automation will allow your organization to operate at the lowest cost possible without having to worry about end-user experiences.

Sustainability

Sustainability strategies require a holistic approach that accounts for emissions and pollutants emitted through various operations specific to different businesses. As previously discussed, public cloud providers are responsible for sustainability of the cloud, but their customers are responsible for sustainable operations in the cloud. Automating dynamic resourcing to maximize efficiency in hybrid and multicloud estates is the best way to responsibly operate in the cloud and materially reduce your carbon footprint today.

The Future of Green IT

As automation becomes more widely adopted by organizations running digital businesses with modern applications, automating sustainability-driven decision making will become a valuable approach to supporting green initiatives. Sustainability aware planning will allow organizations to identify energy intensive workloads for optimization or migration. Sustainability-aware planning will also aid cloud migration by considering the environmental cost of where workloads run. Moreover, sustainability-aware placement will be able to dynamically place workloads based off the environmental cost of where they run and will also enable the customization of analytics in order to prioritize sustainability (over financial cost) for certain workloads or applications. These strategies will allow organizations to unlock a truly elastic and sustainable cloud operations.

Conclusion

IBM Turbonomic provides a clear path for executives seeking a solution to the performance-cost problem while supporting sustainable business value and continued growth. Only Turbonomic analyzes cloud and data center environments, mapping out all the resource dependencies across the stack to dynamically resource applications so that they consume exactly what they need to perform, automatically and continuously. The outcome of this automation is that applications always perform but are never overprovisioned, eliminating cost-overruns and resource waste. Finally, with IBM Turbonomic's proven solution, organizations do not have to compromise between customer experience, budget, and sustainability goals while operating in cloud and data center environments.

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