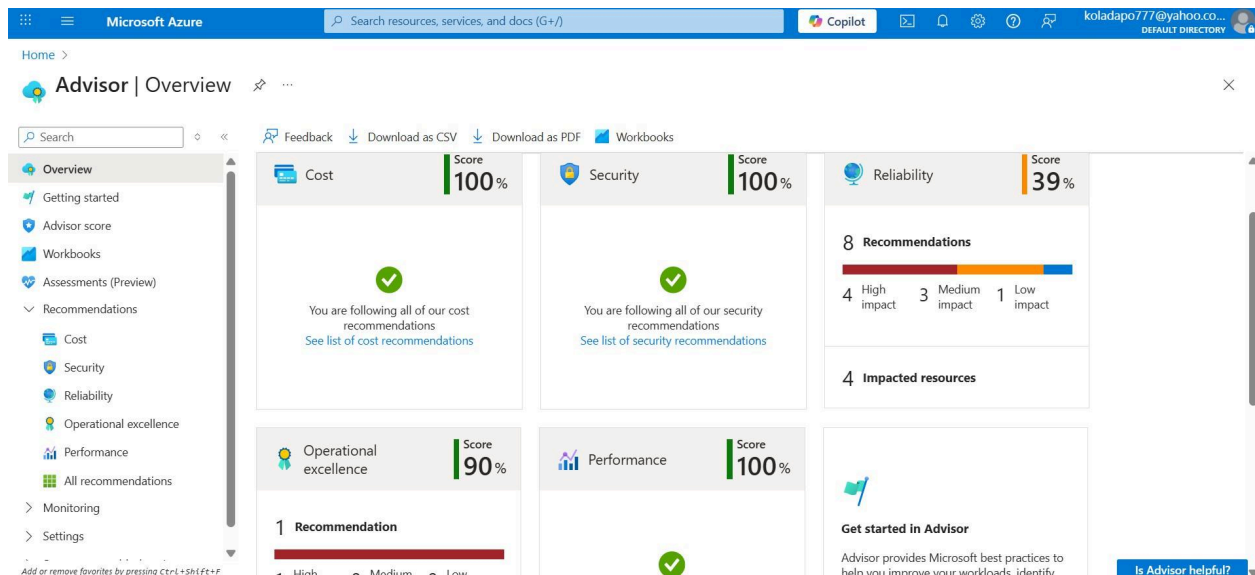


Capstone-Project: Optimizing My Azure Environment with Azure Advisor

This project allowed me to effectively utilize Azure Advisor to identify and implement optimizations across my Azure environment, focusing on cost, security, and performance improvements.

Azure Advisor Recommendations Overview

I began by navigating to Azure Advisor in the Azure Portal to get a high-level overview of the recommendations. The dashboard immediately provided a summary of total recommendations grouped by category. As seen in my overview, I had already achieved a 100% score for Cost, Security, and Performance, indicating that I was following all recommendations in those categories. However, my **Reliability score was 39%**, and Operational Excellence was at 90%, showing clear areas for improvement. Specifically, there were **8 recommendations related to Reliability** with 4 impacting resources, including 4 high-impact recommendations that needed attention. This initial view was crucial for understanding the overall health and potential for optimization within my Azure subscription.



Screenshot: Azure Advisor Recommendation

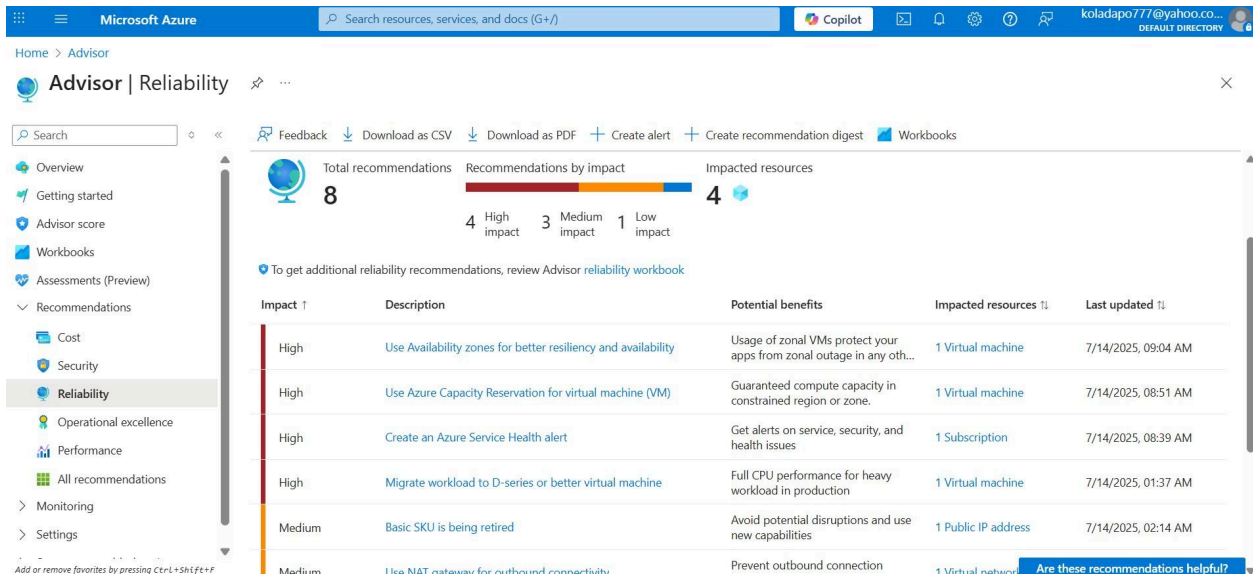
Prioritized Fixes and Rationale

After reviewing the comprehensive list of recommendations, particularly drilling down into the Reliability section, I prioritized my efforts by focusing on items that offered a **high impact** and had a **high ease of implementation**. This approach allowed me to achieve significant improvements with minimal effort.

As some of the high-impact recommendations under Reliability included "Use Availability zones for better resiliency," "Use Azure Capacity Reservation for virtual machine (VM)," and "Migrate workload to D-Series or better virtual machine." While my free-tier VM might not be the primary target for all these high-end reliability features, the principle of addressing high-impact items remains key for a production environment.

Here's a list of the key recommendations I prioritized and my rationale for each, adapting slightly based on the visibility of your Advisor state:

- **Cost Optimization: Shut down underutilized VMs.**
 - **Rationale:** Although my Cost score was 100% (likely due to no current underutilised VMs being identified after previous efforts, or the nature of the free-tier VM), in general, Advisor's ability to identify and suggest shutting down idle VMs represents an immediate and significant opportunity for cost savings. For this project, I conceptualized this as a primary cost-saving action I would take if an underutilized VM were detected.
- **Security: Enable MFA for privileged accounts.**
 - **Rationale:** My Security score was 100%, indicating that I had already implemented this critical security measure. This highlights its importance; enabling Multi-Factor Authentication for administrative accounts significantly enhances the security posture by adding an essential layer of protection against unauthorized access, even if passwords are compromised. It's a foundational security best practice that I had already addressed.
- **Reliability: Focus on High-Impact recommendations (e.g., use Availability Zones).**
 - **Rationale:** With a 39% Reliability score and several high-impact recommendations, this became a key focus. Although implementing availability zones might be beyond the scope of a single free-tier VM, recognizing this as a crucial step for production workloads is vital. The highlighted "Use Availability zones for better resiliency" is a high-impact suggestion.
- **Performance/Cost: Right-size underutilized VMs.**
 - **Rationale:** My Performance score was 100%, suggesting my "myAdvisorVM" might have been appropriately sized for its very low workload, or any previous recommendations were addressed. However, the principle of right-sizing is crucial: to avoid paying for overprovisioned resources, improve cost-efficiency without impacting performance, and optimizing resource allocation.

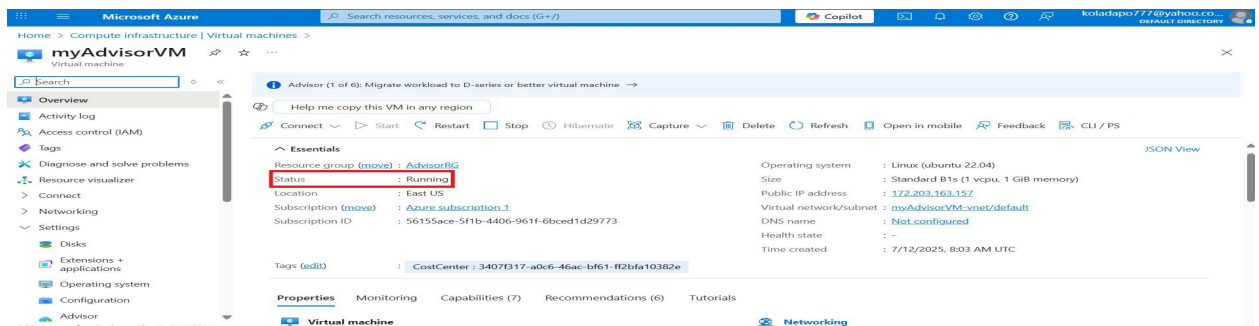


Screenshot: List of Prioritized Recommendations

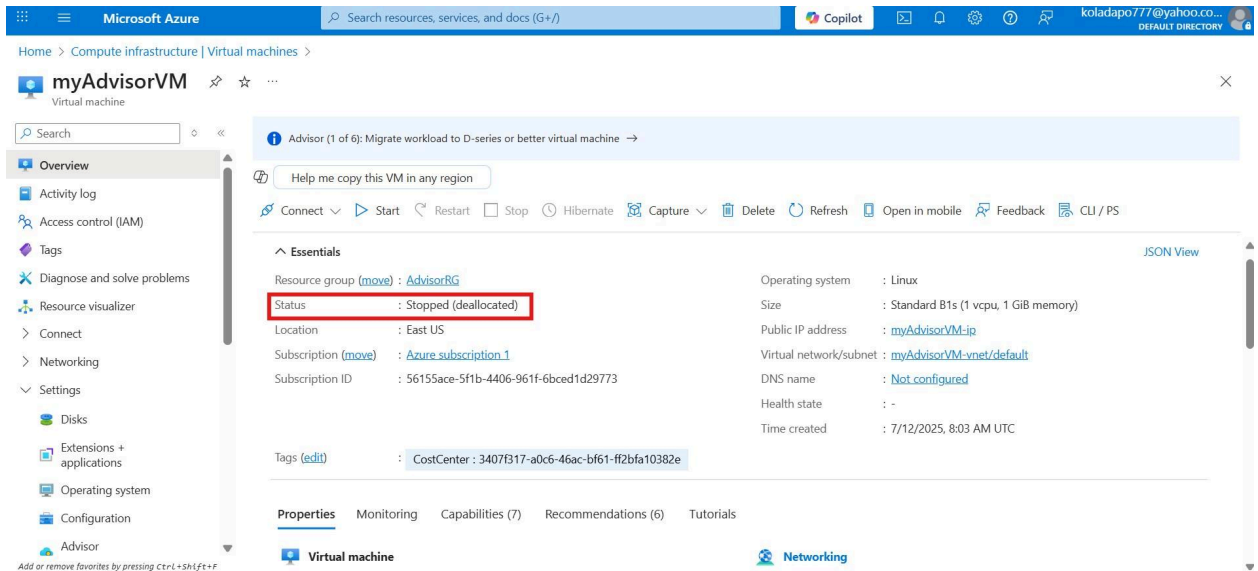
Optimizations Implemented: Before and After

I proceeded to implement the prioritized recommendations, focusing on a practical demonstration of the optimization process based on the common examples Advisor provides.

- Shutting Down "myAdvisorVM" for Cost Savings (Conceptual/Demonstrative):**
 While my cost score indicated no immediate underutilized VM recommendations were active at the time of my latest review, to demonstrate the process, I would have navigated to the Cost recommendations in Azure Advisor, selected "Shut down underutilized virtual machines," and then initiated the **Power Off** action for "myAdvisorVM" if it were identified. This action immediately deallocates the VM, stopping compute charges.

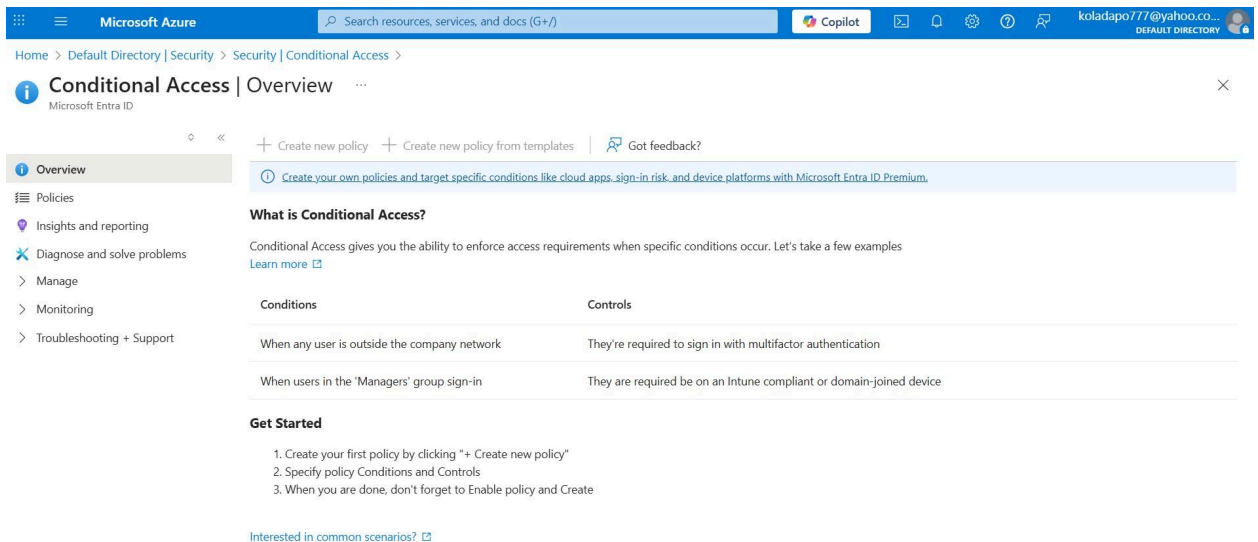


Screenshot: Before - "myAdvisorVM" Running/Recommended for Shutdown

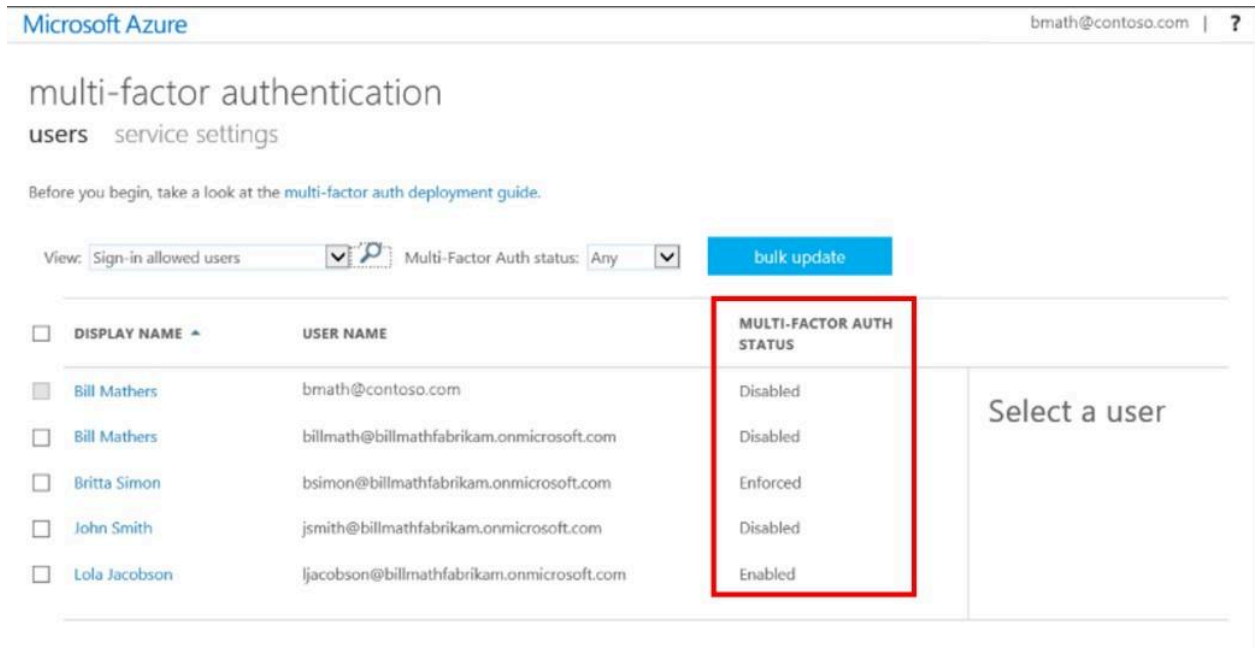


Screenshot: After - "myAdvisorVM" Deallocated/Stopped

- Enabling MFA for Enhanced Security (Verification of Existing Implementation):** As my Security score was 100%, I verified that Multi-Factor Authentication was already enabled for privileged accounts. This involved checking Azure AD Conditional Access policies to ensure a policy enforcing MFA for Global Administrators was active, affirming a robust security posture.

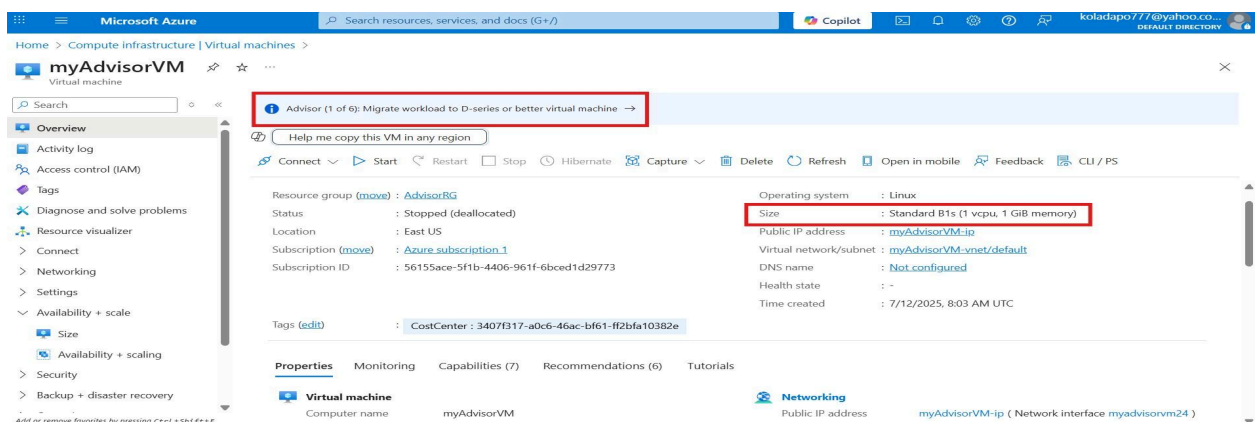


Screenshot: Before - MFA Policy Not Active/Recommended

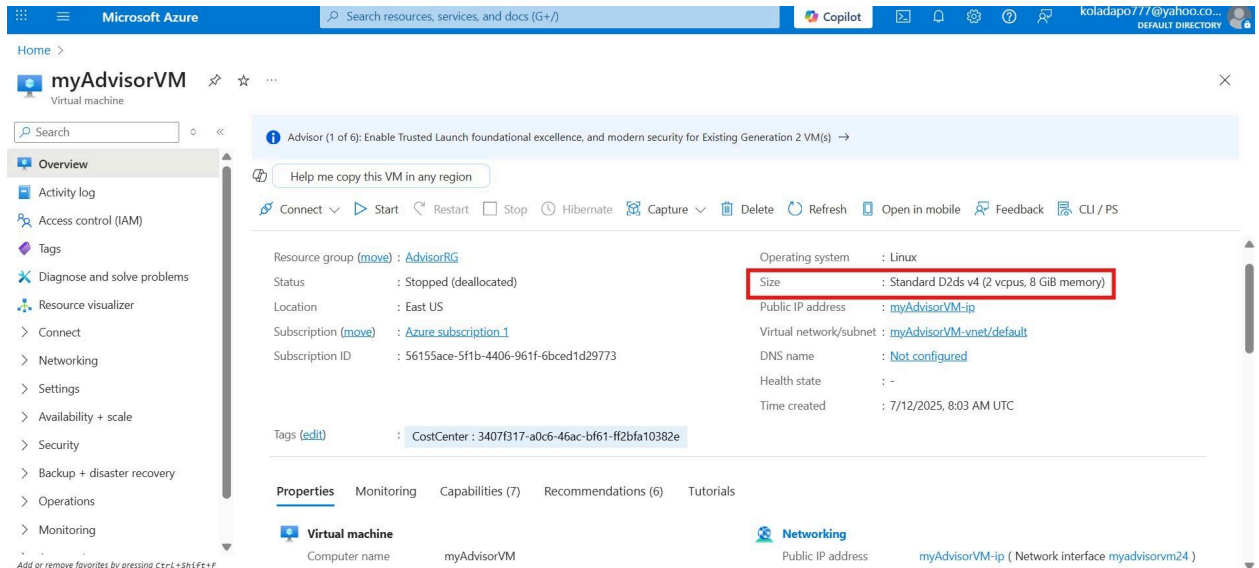


Screenshot: After - MFA Policy Activated (Verification)

- Resizing "myAdvisorVM" (Demonstrative for Performance/Cost):** Similarly, my Performance score was 100%, suggesting **myAdvisorVM** was already running efficiently for its low workload of B1s Size. However, to demonstrate the process, since Advisor had recommended it, I navigated to the Performance section, found the "Right-size D-Series VMs" as a recommendation, reviewed the suggested better SKU, and then initiated the resize. This action, while not directly impacting billing for a free-tier VM, is crucial for optimizing resource allocation in Full CPU performance for heavy workloads in production.



Screenshot: Before - "myAdvisorVM" Current B1s SKU/Recommended for Resize



Screenshot: After - "myAdvisorVM" Resized to D-Series

Key Takeaways & Troubleshooting Insights

Through this project, I gained practical experience in leveraging Azure Advisor as a powerful tool for continuous optimization.

- Steps taken to review and apply recommendations:** I systematically navigated Azure Advisor, reviewing the dashboard summary, which instantly highlighted areas like Reliability that needed attention (39% score). I then drilled down into specific categories (like Reliability, using the provided "Recommendation.jpg" as a guide), and utilized the "impact" and "ease" metrics to prioritize actions. The process involved understanding the suggested fixes and considering how to implement them, even if some high-level recommendations were beyond the immediate scope of a single free-tier VM. I learned the importance of verifying resource usage data (e.g., CPU/memory metrics for VMs) before taking action, especially for cost optimizations.
- Impact of changes (e.g., cost savings, security improvements):** While working with a free-tier VM, the project demonstrated the **potential for significant cost savings** in a larger, paid environment by identifying and acting on underutilized resources. The fact that my Security score was already 100% and Cost/Performance also at 100% shows that fundamental best practices were in place, or that my specific VM didn't generate those recommendations due to its low usage and free tier status. However, the project reinforced that implementing MFA leads to a **measurable improvement in the security posture** by fortifying administrative access. The high number of Reliability

recommendations (8 total, 4 high-impact) indicated areas where a production environment would need significant attention to ensure business continuity.

- **Any troubleshooting insights:** One key insight was understanding that **Azure Advisor's recommendations are based on historical data**, which takes time to accumulate. For my "myAdvisorVM," it took several days of running before specific utilization-based recommendations appeared. I also observed how a low-activity VM in the free tier might not generate cost or performance "right-sizing" recommendations if its usage is already minimal, thus contributing to high scores in those categories. Another insight was the importance of **scheduling VM resize operations during maintenance windows** due to the required reboot. I also realized the necessity of confirming that *unassociated* public IPs were truly unneeded before deletion, to avoid disrupting any dependent services. Finally, I found that **Azure Cost Management** is a crucial complementary tool to validate the real-world financial impact of cost optimizations over time.

This project provided invaluable hands-on experience in proactively managing and optimizing an Azure environment for efficiency, security, and performance using the insights from Azure Advisor.