Problem 1: TCO Comparison (On-Prem vs Azure IaaS vs PaaS)

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| **Aspect** | **Traditional On-Premises** | **Azure IaaS (VMs)** | **Azure Full PaaS (Apps)** |
| **First Year Cost** | ~$15,000 | ~$6,000 | ~$3,600 |
| **Annual Recurring Cost** | ~$2,500–$3,000 | ~$6,000 | ~$3,600 |
| **Upfront Investment** | Very High | None | None |
| **Server Management** | Manual (high effort) | Moderate (VM patching, OS management) | None (Azure manages all) |
| **Scalability** | Manual (buy new servers) | Semi-automatic (scale VMs) | Automatic (App Services scale) |
| **Backup Management** | Manual/NAS-based | Azure Backup Vault | Azure Backup Center (Fully automated) |
| **Availability/Uptime** | Depends on hardware | ~99.9% (with SLA) | ~99.95% (with SLA) |
| **Public Access** | Manual NAT/Firewall setup | Azure Load Balancer + Public IP | Azure Front Door (global load balancing) |
| **Security** | Manual (firewalls, VLANs) | Azure Firewall + NSG | Azure Security Center + DDoS protection |
| **Monitoring** | Manual setup (Prometheus) | Azure Monitor (basic) | Azure Monitor + App Insights (advanced) |
| **Disaster Recovery** | Manual setup needed | Azure Site Recovery (extra cost) | Built-in zone redundancy options |
| **Vendor Lock-In Risk** | Low | Medium | High (PaaS tied to Azure APIs) |
| **Tech Skills Needed** | Linux Admins, Networking, Database Admins | Cloud Admins (VM-focused) | Minimal — DevOps or App Admins only |
| **Time to Deploy** | Weeks–Months | Days–Weeks | Hours–Days |
| **Compliance & Certifications** | Your responsibility | Azure provided | Azure provided |
| **Ideal For** | Organizations needing full control, in-house teams | Lift-and-shift cloud migration | Cloud-native, minimal-ops businesses |

# Conclusion

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| **Scenario** | **Best Option** |
| Minimum Cost (long term) | Azure Full PaaS |
| Minimum Maintenance | Azure Full PaaS |
| Maximum Control | Traditional On-Premises |
| Quick Migration | Azure IaaS |
| Highest Scalability/Flexibility | Azure Full PaaS |