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1. Solution Overview

Imagine your team building a banking app for thousands of users. Every new feature, like a redesigned login page, needs testing to ensure it works perfectly. AgentQA, an AI-powered testing platform on Microsoft Azure, makes this easy. Using Azure OpenAI, it creates and updates tests automatically from simple instructions, like “test the login page.” It runs tests on real devices in the cloud, catches bugs fast, and scales to handle any project size, just like Netflix uses Azure to stream to millions. AgentQA cuts testing time by 60%, reduces bugs by 40%, and speeds up releases by 50%, helping you launch high-quality apps faster.

2. Problem Statement

Software teams often deal with slow, manual testing that causes delays and bugs. Traditional tools require constant updates, deep technical know-how, and tight CI/CD setups, which slow down innovation. Teams need a simple, secure, and scalable solution that supports all testing types (unit, regression, performance, security, AI agent behavior, and prompt evaluation) and works with their existing tools without needing expert skills.

3. Solution Detail

3.1 Description

AgentQA uses Azure’s AI and cloud tools to automate testing, making it fast and user-friendly.

Core Functionality:

- **Natural Language Test Creation:** Azure OpenAI turns simple instructions (e.g., “test payment confirmation”) into test cases for unit, integration, regression, performance, security, AI agent, and prompt evaluation testing.
- **Test Execution:** Playwright handles browser tests, while Model Context Protocol (MCP) validates web and AI agent systems.
- **Flexible Triggers:** Run tests via a chat interface, scheduled CI/CD, or on-demand.

- **Real-Time Feedback:** Get clear, AI-generated summaries of test results through chat or dashboards.
- **Scalable Workflows:** Azure’s serverless tools manage tests for any team size, from startups to enterprises.

Technical Architecture:

- **Azure API Management:** Handles test instructions from the chat UI.
- **Azure Functions:** Manages test logic and routing, keeping things fast and cost-efficient.
- **Azure OpenAI:** Creates test scripts from natural language prompts.
- **Playwright & MCP:** Runs functional and AI-driven tests on secure, scalable environments.
- **Azure Container Apps:** Supports high-volume test runs for big launches.
- **Azure Blob Storage & Cosmos DB:** Stores test results and logs for quick access and compliance.
- **Azure Monitor & Defender for Cloud:** Tracks performance and ensures security.

3.2 Use Cases

- **Natural Language Testing:** Generate tests for web apps and AI agents using simple prompts.
- **On-Demand Testing:** Run tests via chat for quick feedback during development.
- **Scalable Workflows:** Handle thousands of tests for large apps, like e-commerce platforms during Black Friday.
- **Prompt & Agent Evaluation:** Test AI agents’ tone and accuracy, perfect for chatbots or virtual assistants.
- **Regression Testing:** Ensure new features don’t break existing ones, like a “Buy Now” button in retail apps.
- **Security Testing:** Validate apps against vulnerabilities, critical for finance and healthcare.

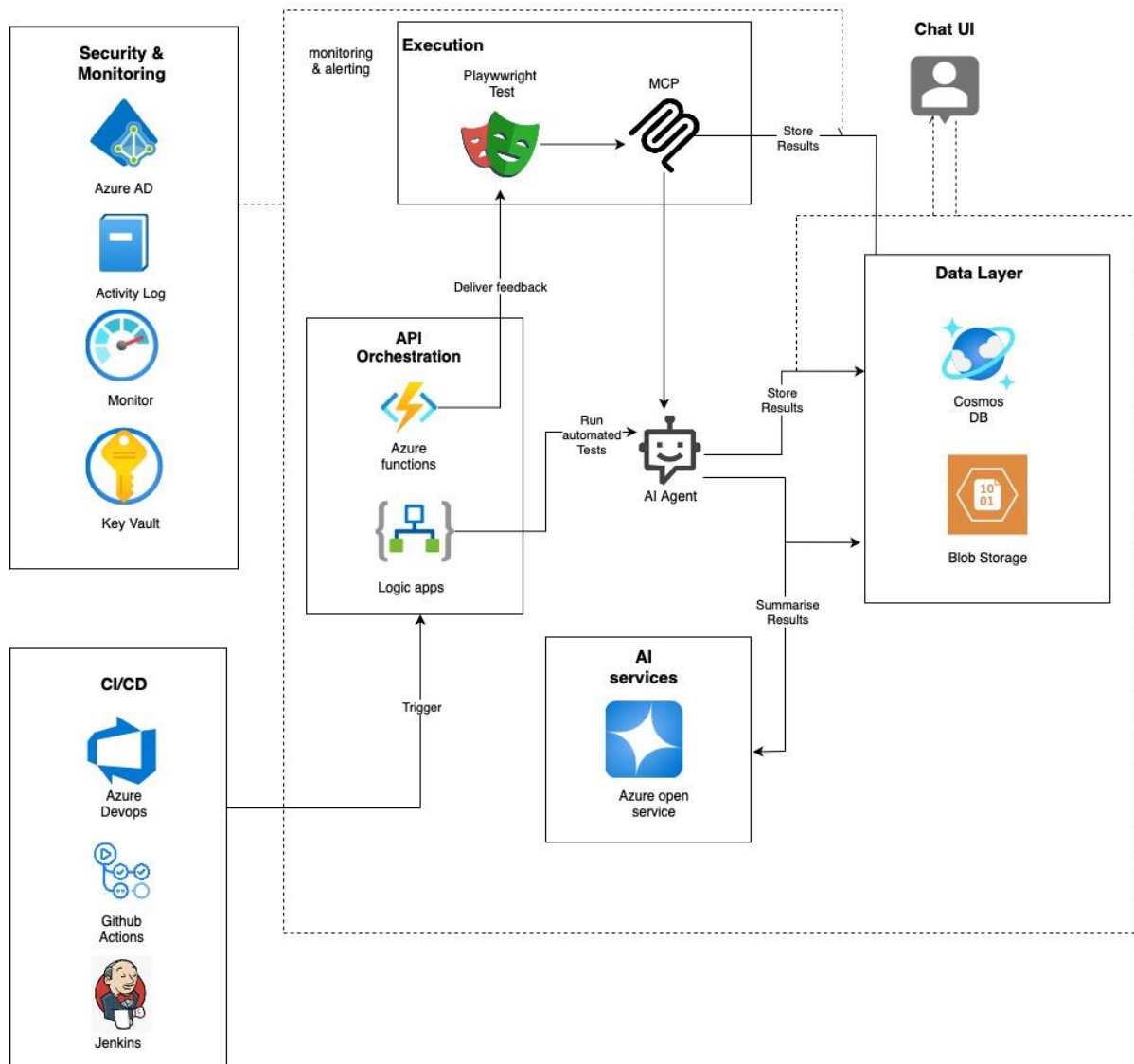
3.3 Technical Requirements

To use AgentQA, you’ll need:

- An **Azure subscription** with access to Azure OpenAI, Azure Functions, Key Vault, Azure Active Directory (AAD), Blob Storage, Cosmos DB, and Azure Container Apps.

- **Model Context Protocol (MCP)** containers for executing web and AI agent tests.
- **Chat interface** (Microsoft Teams, Web UI, or CLI) for easy test triggers.
- **CI/CD integration** with tools like Azure DevOps, GitHub Actions, or Jenkins for automated workflows.
- **Secure network setup** to protect private data, with no public internet exposure needed—great for sensitive apps.
- **.NET Core or Python** compatibility to fit your tech stack.
- **Cloud device farms** (optional) for testing on real browsers and devices.
- **Compliance support** for standards like GDPR, HIPAA, or PCI-DSS, ensuring regulatory needs are met.

These make AgentQA simple to set up, secure, and ready to scale.



Agent QA: Low-level Architecture

3.4 Solution Selling Proposition

AgentQA is a no-code, AI-driven testing platform that simplifies testing for web and AI systems. With minimal setup, it delivers fast, actionable results using Azure's powerful cloud tools. It saves time, cuts costs, and scales effortlessly, making it perfect for teams of any size.

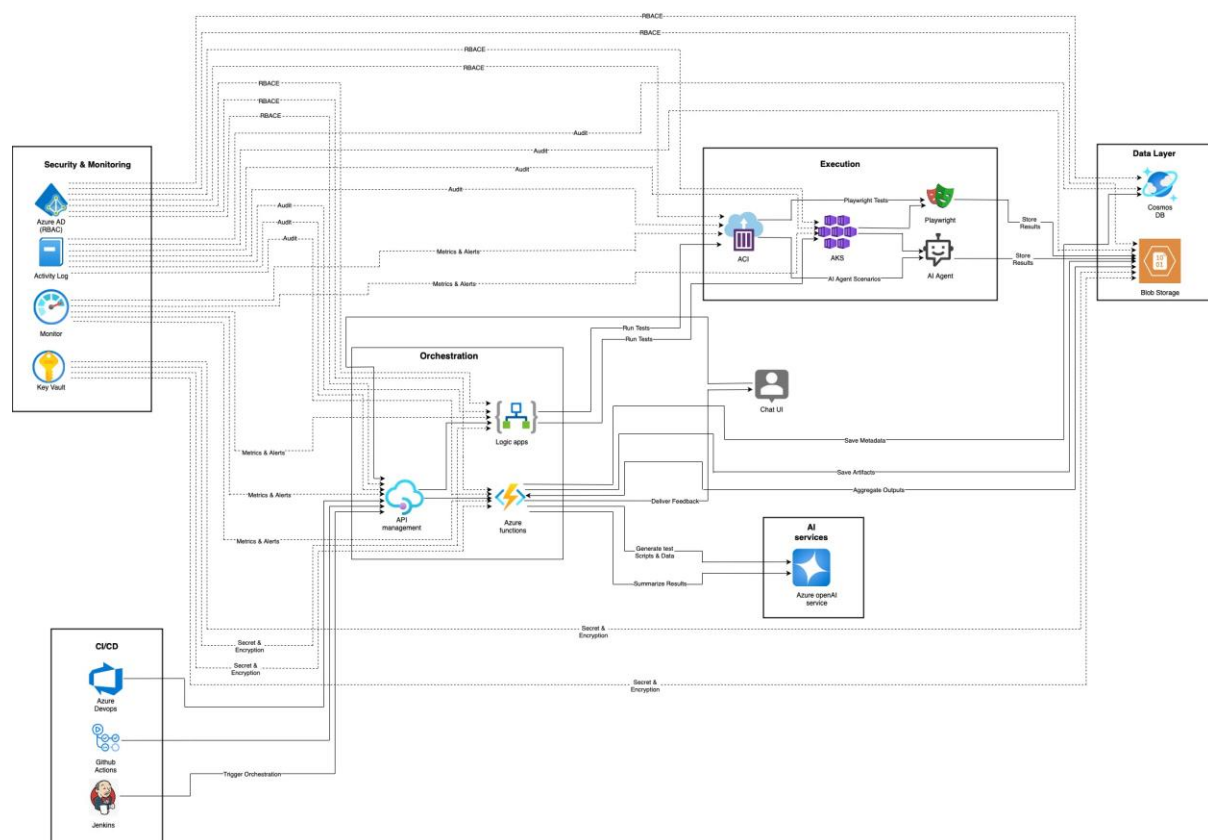
3.5 Solution Availability

- Fully production-ready for immediate use.
- Configurable for enterprise environments with custom security and scale needs.
- Available on the Azure Marketplace for easy deployment.

3.6 Solution URL

<https://www.agentqa.ai>

4. Technical Architecture

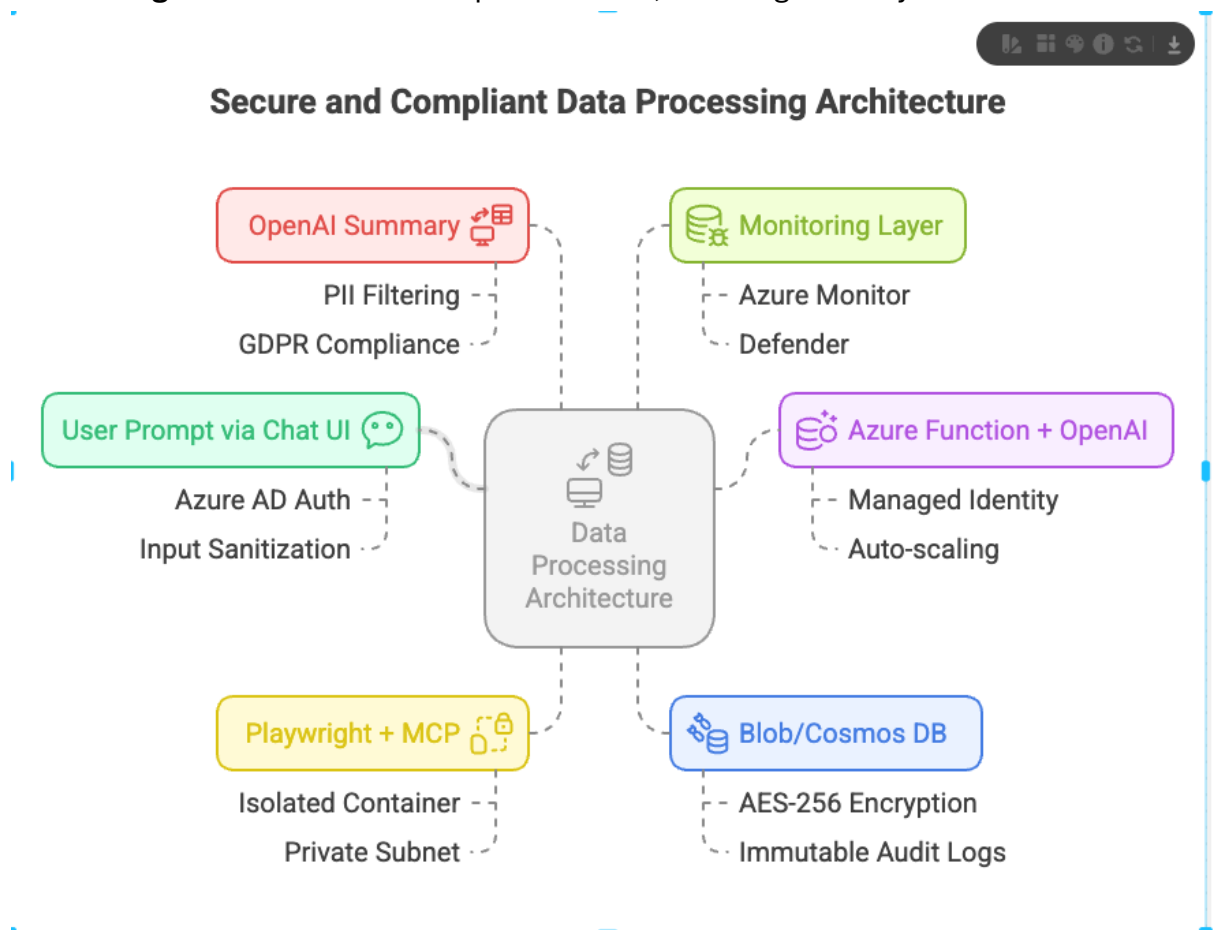


Agent QA: High-level Architecture

4.1 Architectural Overview

AgentQA's architecture is built on Azure for flexibility and scale:

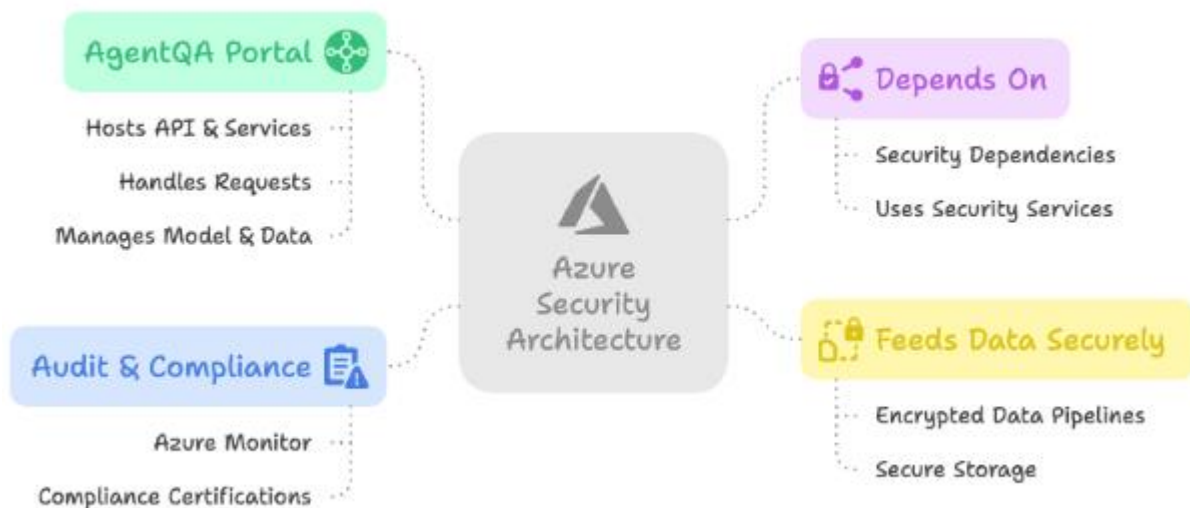
- **Chat UI (Teams/Web/CLI):** Accepts simple test instructions, like “test the login flow.”
- **Azure Functions + OpenAI:** Generates test cases from prompts, keeping things lightweight.
- **Playwright + MCP:** Runs tests on browsers and AI systems in secure cloud environments.
- **Blob Storage & Cosmos DB:** Stores results and logs for fast access and compliance.
- **OpenAI Summary:** Turns test results into easy-to-read summaries.
- **Scalability:** Azure Functions and Container Apps handle high-volume testing, like during app launches.
- **Monitoring:** Azure Monitor tracks performance, ensuring no delays.



4.2 Security Architecture

AgentQA keeps your data safe:

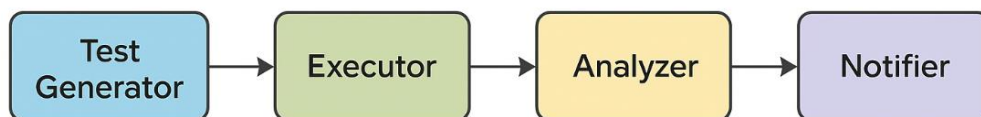
- **Azure Active Directory (AAD):** Secures access to the AgentQA Portal APIs and services with role-based access control.
- **Azure Key Vault:** Safely stores secrets and certificates required by dependent services.
- **Data Encryption:** Ensures all communication and storage use encryption (TLS for transit, AES for rest).
- **Microsoft Defender for Cloud:** Provides real-time threat detection and compliance monitoring.
- **Azure Monitor & Audit Logs:** Track all access and system-level actions for regulatory traceability.



5. Key Components

- **AI Test Generator:** Picture a clever assistant that whips up tests whenever you add a new feature, like a sign-up button. It's like a checklist that updates itself, saving your team hours. Using Azure OpenAI, it turns simple instructions (e.g., "test the login") into Playwright or Postman scripts for web and API testing.
- **Prompt Validator:** This tool checks if your AI's responses, like a chatbot's replies, are spot-on. Powered by Langfuse, it ensures your large language models (LLMs) deliver accurate and friendly answers, like a coach reviewing a player's performance.

- **Agent Executors:** Think of these as virtual testers checking your app on real cloud devices, like inspectors making sure every part of a building is perfect. They run browser and API tests across different environments to catch any hiccups.
- **Defect Analyzer:** An AI-powered detective that spots bugs, groups them, and explains what's wrong. Like a security camera finding patterns, it flags UI and API test failures fast, helping your team fix issues in no time.
- **Data Service:** Safely stores test results in Azure's cloud, like a locked safe protecting your important files. It uses Azure Blob Storage and Cosmos DB for quick, secure access to your data.
- **Integration API Layer:** Hooks up smoothly with tools you already use, like Azure DevOps or Jenkins. It's like a browser plug-in that makes your workflow better, keeping everything connected.
- **Logging Module:** Captures every test detail in Azure Cosmos DB and Blob Storage, like a detailed journal. This ensures you have a clear record for troubleshooting or compliance needs.
- **Notification Agent:** Sends test results straight to your team via Slack or Jira comments, like a friendly messenger keeping everyone in the loop. It delivers clear updates so you can act fast.



6. Integration Points

- AgentQA works smoothly with Azure tools to make testing a breeze:
- **Azure DevOps:** Runs tests automatically every time you update code, like a factory checking every product before it ships.
- **Azure Active Directory (AAD):** Keeps test reports safe, so only the right people see them, like a keycard for a secure office.
- **Application Insights:** Shows live dashboards to track how tests are doing, like a control tower guiding planes.
- **Key Vault:** Protects passwords and secrets, like a bank locking up your PIN.
- **Azure Monitor:** Watches for problems and alerts your team, keeping everything on track.

- **Cosmos DB:** Stores test data for quick access, even during crazy busy times like Black Friday sales.
- **Azure Kubernetes Service (AKS):** Adds more testing power when you need it, like hiring extra staff for a big event.

7. Use Cases

- **Regression Testing:** For online stores, it checks things like the “Buy Now” button to catch issues before customers do.
- **Shift-Left Testing:** Tests smart home apps early, cutting bugs by up to 50% before launch.
- **Continuous Execution:** For apps updated daily, AgentQA runs overnight tests to spot problems before morning.
- **API Validation:** Helps telecom companies test new plans, ensuring smooth launches.
- **AI-Driven Exploratory Testing:** Finds hidden bugs in new features, like personalization, so users have a great experience.

8. Customer Pain Points Addressed

- **Less Manual Work:** No more late nights rewriting tests after app changes, saving time and stress.
- **Fix Flaky Tests:** Spots tests that randomly fail, making results you can trust.
- **Better Coverage:** Tests more of your app, catching issues like broken date pickers on travel sites, keeping customers happy.
- **Faster Launches:** Gets your app to market weeks sooner, giving you an edge.

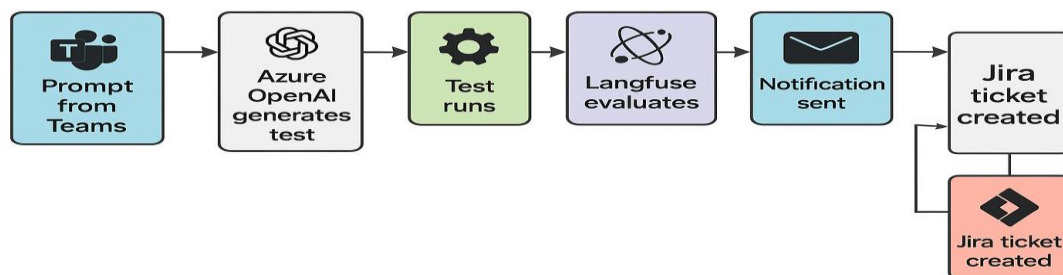
9. Industry-Specific Applications

- **Finance:** Tests banking rules automatically, creating audit-ready records and cutting compliance costs by 40%. Checks secure logins and fraud systems, keeping apps safe.
- **Healthcare:** Ensures health record systems meet HIPAA rules, cutting testing from weeks to days. Validates chatbots and patient data security, like a digital health inspector.
- **Retail:** Keeps checkout running during sales updates, like Black Friday, ensuring customers can buy. Continuous tests caught bugs, boosting revenue by 20%.
- **Telecom:** Tests sign-up portals for new plans, ensuring smooth launches. Checks billing and interfaces, preventing customer frustration.

- **Gaming:** Ensures multiplayer games work across devices during peak times. Tests load and chat features, keeping players happy.

10. Sample Customer Journey

- **Insurance company adopts AgentQA** from Azure Marketplace.
- **Connects easily** to Azure DevOps or GitHub pipeline.
- **New feature added** (e.g., quote calculator for insurance plans).
- **QA team types** “test quote form and chatbot tone” in Teams chat.
- **Azure OpenAI generates:**
 - Playwright tests for UI.
 - API checks for backend.
 - Langfuse evaluations for chatbot accuracy.
- **Tests run** on cloud devices, catching form glitches before customers notice.
- **Results stored** in Cosmos DB for quick access.
- **Summaries sent** to Teams and Slack; Jira tickets auto-created for fixes.
- **Tests stay updated** as new plans launch, no extra work needed.
- **Outcomes in 3 months:**
 - 60% less testing time.
 - 50% faster plan launches.
 - Zero bug complaints, glowing customer reviews.



11. Technical Requirements

- Must have an Azure account with services like AKS, Machine Learning, and Cosmos DB enabled.
- .NET Core or Python compatibility for flexible integration with varied tech stacks.
- CI/CD integration for modern development workflows.
- Secure network setup for private data and applications (no public internet exposure required).

12. Security Architecture

AgentQA keeps your data safe:

- **Data Encryption:** Protects data like secure chat apps protect your messages.
- **Azure Active Directory:** Only lets approved team members see reports, like a private vault.
- **Audit Logs:** Tracks every action for industries like healthcare and finance, making compliance easy.
- **Key Vault:** Locks away sensitive info, like a bank securing your PIN.

13. Performance Considerations

- **Scales Easily:** Handles big launches, like a million app downloads, by adding more test power instantly.
- **Fast Testing:** Runs tests at the same time, so you get results quickly, perfect for tight deadlines.
- **Cosmos DB:** Makes test data available fast, even for teams working across the globe.
- **Real-Time Alerts:** Spots issues, like tests failing on certain phones, in minutes.

14. Tools and Azure Services Used

- **Azure Kubernetes Service (AKS):** Adds testing power during busy times.
- **Azure Machine Learning:** Picks the most important tests to save time.
- **Cosmos DB:** Stores test data for quick, global access.
- **Azure DevOps, Application Insights, Logic Apps, Key Vault, AAD:** A full set of tools for automation, security, and monitoring.

- **Azure Blob Storage:** Saves test data for long-term use and compliance.

15. Users of Agent

- **QA Engineers:** Focus on strategy, not repetitive scripting.
- **Frontend Developers:** Test web apps quickly with Playwright.
- **AI/ML Engineers:** Validate AI agent behaviour and prompts.
- **Product Managers:** Trigger tests and read clear reports via chat.
- **DevOps Teams:** Integrate testing into CI/CD pipelines.

16. Dependencies

- **Reliable Azure access:** Steady connection to Azure services, like dependable internet for your office, to run tests smoothly.
- **Azure services enabled:** Access to Azure OpenAI for AI test generation, Blob Storage and Cosmos DB for secure data storage, and App Services for scalable test execution.
- **Source code and builds:** Provide code, builds, and feature details to create meaningful tests, like sharing blueprints for a house inspection.
- **Cloud device farms:** Use Azure's cloud devices or third-party farms to test on real phones and browsers if local devices aren't available.
- **CI/CD integration:** Connect to GitHub or Azure DevOps repos for automated test triggers, keeping your pipeline humming.
- **Secure tokens:** Store Slack or Jira tokens in Azure Key Vault for safe notifications, like locking keys in a safe.
- **MCP setup:** Use an MCP container or local emulator to test AI agent behaviors, ensuring chatbots act as expected.
- **Langfuse API key (optional):** Needed for evaluating large language model (LLM) responses, like checking a chatbot's tone.

17. Key Benefits and Differentiators

- **Natural Language Testing:** Create tests with simple prompts, no coding needed.
- **Smart Updates:** Keeps tests fresh as your app grows, so nothing gets outdated.

- **Quick Bug Fixes:** Finds and sorts bugs in hours, not days, unlike manual testing.
- **No-Code Interface:** Easy for non-tech users to run tests via chat.
- **Real-Time Insights:** Get clear results instantly, speeding up fixes.
- **CI/CD Flexibility:** Works with or without rigid CI/CD setups.
- **Cost-Efficient:** Cuts testing costs by up to 60% with automation.
- **Scalable:** Handles small startups to global enterprises.
- **Top-Notch Security:** Meets tough rules like GDPR or HIPAA for peace of mind.

18. Value Proposition

AgentQA transforms testing with Azure's AI and cloud power. It lets teams—from developers to product managers—build, run, and review tests quickly without needing deep tech skills. By cutting test cycles by 60%, reducing bugs by 40%, and boosting release speed by 50%, it saves money and delivers better apps, like how ride-sharing apps focus on riders, not logistics.

19. Conclusion

AgentQA is your team's tireless testing buddy, powered by Azure's AI and cloud tools. It automates all testing types—from unit to AI prompt evaluation—making apps like banking or e-commerce launch faster with fewer bugs. With 60% faster testing, 40% fewer defects, and top-notch security, AgentQA is built for teams who want. smart, scalable QA. In today's fast-paced world, it keeps your software ahead, delivering awesome user experiences.