aspire SYSTEMS

attention. always.

Aspire Systems empowers a Kuwait Bank with Intelligent Banking Capabilities with Azure DevOps

About The Customer

Established in 1952, Client is the first Indigenous bank of Kuwait and first shareholding company in the entire Gulf region. Client's network now comprises of **150** branches, subsidiaries and representative offices in **15** countries on four continents, of which eight are in the Middle East.

The Client Group also handles other business areas such as Corporate Governance and Engineering. The Engineering Department is dedicated for providing a one-stop service for all elements of the construction process from planning, design, construction to operation and maintenance.

The Challenge

Client is a provider of banking services, investment services in Middle East and other parts of the world. Client is in pursuit of cloud services, to host their applications on cloud.

- Customer doesn't have cloud presence and want to speed up their release cycle without compromising on security. They have mobile applications and server-side applications.

- Creating Infrastructure on cloud, developing a CI-CD Solution for agility, monitoring, alerting etc., should be carried out from scratch. Client's development and testing vendors are separate, and the DEV/TEST activities are carried out on their on-premise servers, making it difficult to get them all onto the same platform and streamline the process.

- IOS Build to be performed on Azure Hosted agent.
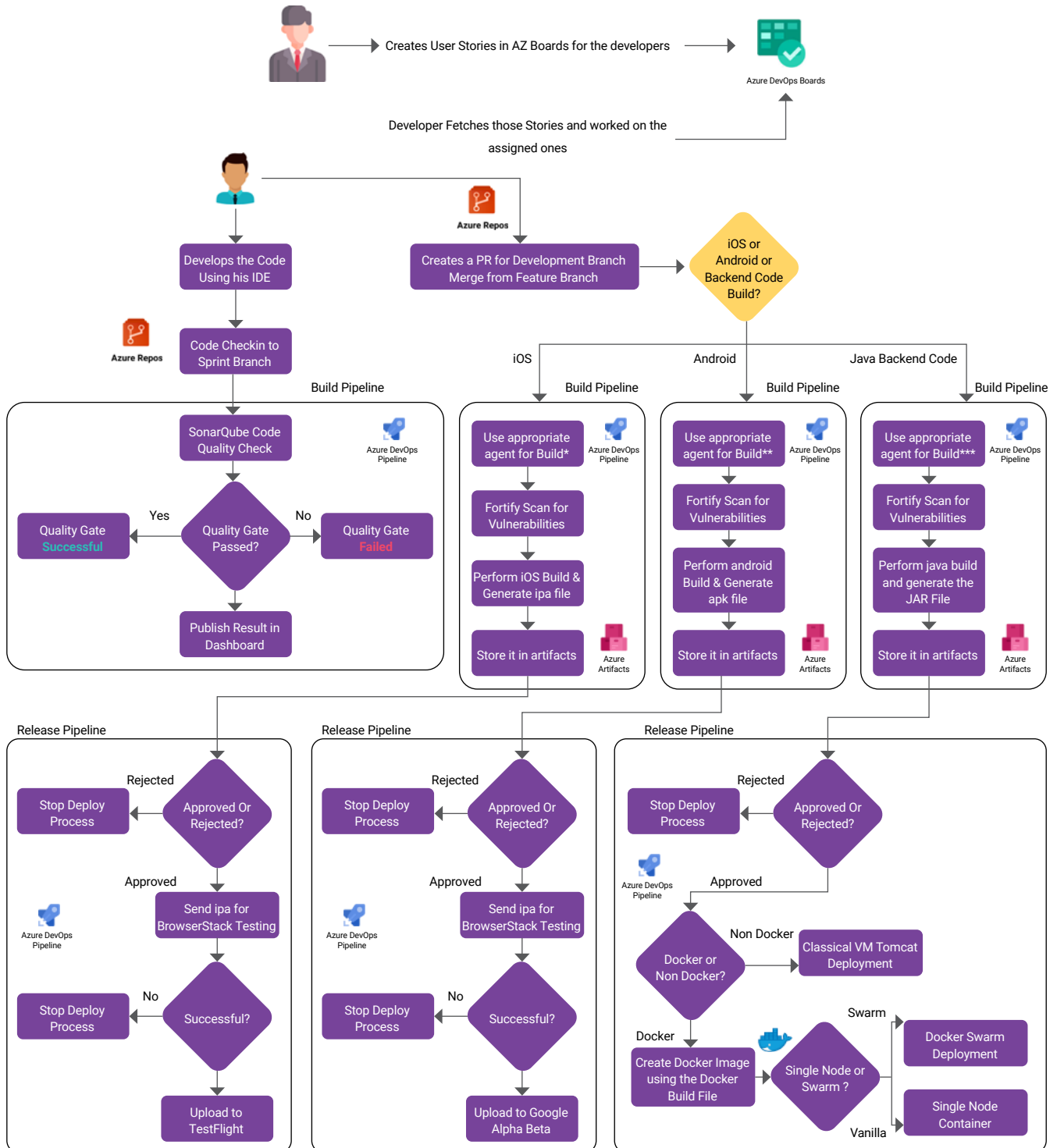
Client wants to merge all these activities to Azure Cloud and work seamlessly. Re-platforming to Azure gives the following benefits:

- Redmine is replaced with Azure Boards

- On-Premise Git server is synchronized with Azure Repos

- Artifacts/Dependencies in Nexus server migrated to Azure Artifacts

- Integrated security tools as AppDome, Checkmarx with Azure Pipelines

Architecture Diagram

Creates User Stories in AZ Boards for the developers

Azure DevOps Boards

Developer Fetches those Stories and worked on the assigned ones

Azure Repos

Develops the Code Using his IDE

Creates a PR for Development Branch Merge from Feature Branch

iOS or Android or Backend Code Build?

Azure Repos

Code Checkin to Sprint Branch

iOS   Android   Java Backend Code

Build Pipeline

SonarQube Code Quality Check

Azure DevOps Pipeline

Quality Gate Successful — Yes — **Quality Gate Passed?** — No — **Quality Gate Failed**

Publish Result in Dashboard

Build Pipeline

Use appropriate agent for Build* — Azure DevOps Pipeline

Fortify Scan for Vulnerabilities

Perform iOS Build & Generate ipa file

Store it in artifacts — Azure Artifacts

Build Pipeline

Use appropriate agent for Build** — Azure DevOps Pipeline

Fortify Scan for Vulnerabilities

Perform android Build & Generate apk file

Store it in artifacts — Azure Artifacts

Build Pipeline

Use appropriate agent for Build* * — Azure DevOps Pipeline

Fortify Scan for Vulnerabilities

Perform java build and generate the JAR File

Store it in artifacts — Azure Artifacts

Release Pipeline

Rejected — **Stop Deploy Process** — **Approved Or Rejected?**

Approved

Send ipa for BrowserStack Testing

Azure DevOps Pipeline

No — **Stop Deploy Process** — **Successful?**

Upload to TestFlight

Release Pipeline

Rejected — **Stop Deploy Process** — **Approved Or Rejected?**

Approved

Send ipa for BrowserStack Testing

Azure DevOps Pipeline

No — **Stop Deploy Process** — **Successful?**

Upload to Google Alpha Beta

Release Pipeline

Rejected — **Stop Deploy Process** — **Approved Or Rejected?**

Azure DevOps Pipeline

Approved

Docker or Non Docker? — Non Docker — **Classical VM Tomcat Deployment**

Docker

Create Docker Image using the Docker Build File — **Single Node or Swarm ?** — Swarm — **Docker Swarm Deployment**

Vanilla — **Single Node Container**

Above Diagram depicts the DevOps Process for understanding purpose only, deviations might exist when implemented.

*   For Macos, the Microsoft agent will be considered, in case of incompatibility self hosted MacOS is needed which will be setup by NBK

**   For Android, the Microsoft agent will be considered in case of incompatibility self hosted Windows with Android tools is needed & will be setup by NBK
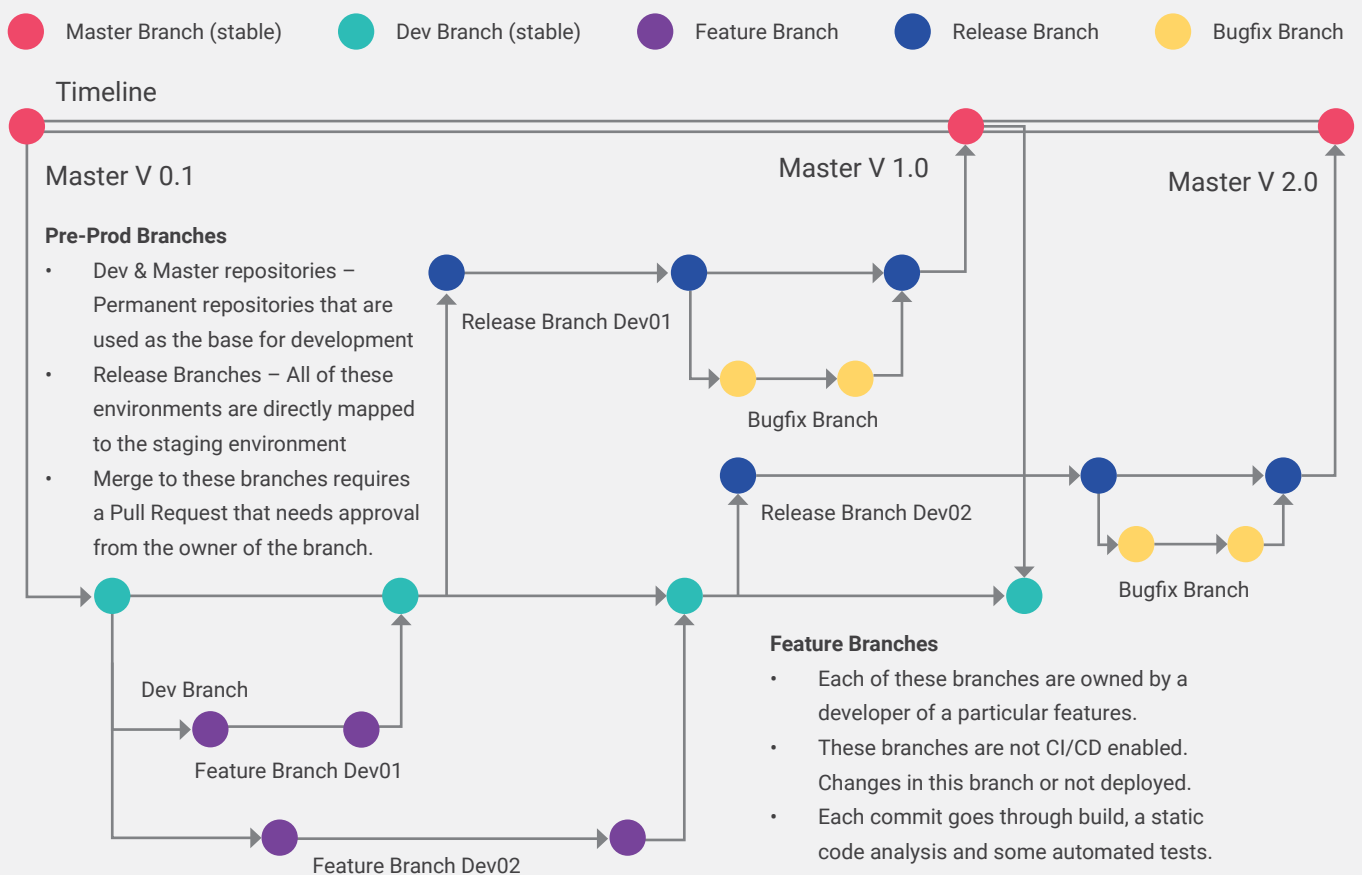
*** For Java Backend Build, the Microsoft agent will be considered with relevant tasks, in case of incompatibility self hosted Windows/Linux with Backend code build tools are needed & will be setup by NBK
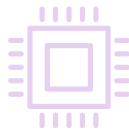
Aspire's Solution

- Aspire's DevOps team used SonarQube & Checkmarx to ensure the quality of the code and Browser Stack to perform testing for mobile applications.

- Proper branching policies have been enabled for all the branches.

- The Pipeline setup was seamless without manual intervention expect for approval on deployment phase to the environments is ensured.

- Azure Key Vault has been used in pipeline to make sure the sensitive data is secured and encrypted

- The build artifacts for all the applications (mobile and server side) were properly versioned and maintained in Azure Artifacts in a secured way

Branching Diagram

● Master Branch (stable)　● Dev Branch (stable)　● Feature Branch　● Release Branch　● Bugfix Branch

Timeline

Master V 0.1

Master V 1.0

Master V 2.0

Pre-Prod Branches
- Dev & Master repositories – Permanent repositories that are used as the base for development
- Release Branches – All of these environments are directly mapped to the staging environment
- Merge to these branches requires a Pull Request that needs approval from the owner of the branch.

Release Branch Dev01

Bugfix Branch

Release Branch Dev02

Bugfix Branch

Dev Branch

Feature Branch Dev01

Feature Branch Dev02

Feature Branches
- Each of these branches are owned by a developer of a particular features.
- These branches are not CI/CD enabled. Changes in this branch or not deployed.
- Each commit goes through build, a static code analysis and some automated tests.

Technology Snapshot

CI/CD
- Azure DevOps

CODE QUALITY CHECK
- SonarQube

SAST, IAST & SCA
- Checkmarx

TESTING
- BrowserStack

Security Tools
- Azure Sentinel, AppDome

Secret Management
- Azure Key Vault

Artifact Management
- Azure Artifact Feed

Infra Provisioning:
- Terraform

Platform:
- Azure Cloud

LANGUAGES
- Java (Server)
- IOS (Swift)
- Android (Kotlin)
- JavaScript (Frontend)

Result and ROI

- **IaC** [Terraform] provisioning reduced the manual efforts of deploying infrastructure to matter of minutes from hours

- Instant Feedback on the quality of the code using **SonarQube** and **Checkmarx**, thereby increasing development quality by **80%**

- Security Integration into the Mobile Apps using **AppDome** enabled **improved safety** and **robust artifacts** releases

- Frequent releases enabled testers and developers to clear up the backlog at a faster rate by **50%**

- On-boarding of vendors onto **Azure**, completely eliminated diverse development environments.

- **Azure Sentinel** is used for monitoring log-in and detecting suspicious logins at regular intervals

- Enabling **Single Common Process** across multiple vendors

- Eliminated unwanted/unused/repetitive licenses across products by leveraging all the features of **Azure DevOps Services**

- Clear segregation between user and team roles through **Azure Permissions** helped the customer to have smooth partition among different projects

- **Azure Microsoft Mac Agents** eliminated the need for physical mac machines as Self Hosted Agents

Future Impact

- Aspire's DevOps CI/CD implementation helped customer to reduce the manual efforts and increased their productivity.

About Aspire

Aspire Systems is a global technology services firm serving as a trusted technology partner for our customers. We work with some of the world's most innovative enterprises and independent software vendors, helping them leverage technology and outsourcing in our specific areas of expertise. Our core philosophy of "Attention. Always." communicates our belief in lavishing care and attention on our customer and employees.

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