System Admin Guide

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**System Admin Guide:**

**1. Introduction**

The System Admin Guide provides instructions for deploying, maintaining, and securing the Secure Messaging Application. This guide covers server setup, database management, application security, and troubleshooting.

**2. Prerequisites**

* Azure Subscription: Ensure that you have an active Microsoft Azure account with sufficient permissions to create and manage resources.
* Deployment Requirements:
  + PHP 8.x
  + MySQL database
  + An SSH key for secure access to the Azure server
* Azure Services:
  + Azure App Service: For hosting the web application
  + Azure Database for MySQL: For database hosting
  + Azure Storage Account: For storing any additional resources if needed space is needed

**3. Application Deployment**

3.1 Setting up the Azure Database for MySQL

1. Create an Azure Database for MySQL server:
   * Go to the Azure portal and click on Create a resource > Databases > Azure Database for MySQL.
   * Configure your database settings
   * Choose the pricing tier based on the expected load.
2. **Configure firewall settings**:
   * In the MySQL server settings, add your client IP address or set up a rule for "Allow Azure services and resources to access this server."
3. **Import the database**:
   * Upload your .sql DDL file to the Azure Database for MySQL using tools like MySQL Workbench or phpMyAdmin.

**3.2 Deploying the Web Application to Azure App Service**

1. **Create an Azure App Service**:
   * In the Azure portal, select **Create a resource** > **Web** > **App Service**.
   * Configure your settings (e.g., app name, resource group, runtime stack set to PHP 8.x, and operating system as Linux).
2. **Configure the App Service**:
   * Set the **PHP version** to the latest 8.x version from the settings.
   * Configure the **Connection Strings** in the Azure portal under **Configuration** to connect the app with the Azure Database for MySQL.
3. **Deploy your code**:
   * **Using GitHub Integration**:
     + In your Azure App Service, select **Deployment Center** and connect to your GitHub repository.
     + Set up the branch and deployment options for automated deployments.
   * **Using FTP or Azure CLI**:
     + Upload your project files to the Azure App Service using an FTP client or the Azure CLI.
     + Ensure all files, including config.php, have been updated with the correct database connection details.
4. **Set up environment variables**:
   * Use the Azure App Service **Configuration** settings to define your environment variables, including database credentials, encryption keys, and other configuration data.

**3.3 Configuring Storage and Backup**

1. **Backup the Azure Database for MySQL**:
   * Enable automatic backups through the **Azure Database for MySQL** settings to ensure regular backups.
2. **Enable Azure App Service Backups**:
   * In the App Service, navigate to **Backups** and configure regular backups of your application files and database.

**4. Application Management**

**4.1 Monitoring and Logging**

* **Azure Monitor**: Use Azure Monitor to track application performance, error rates, and server health.
* **Application Insights**: Integrate Application Insights for real-time monitoring and troubleshooting of the app.

**4.2 Scaling the Application**

* Adjust the App Service **Pricing Tier** to scale up or down based on user demand.
* Enable **Autoscaling** to automatically adjust resources based on CPU or memory usage.

**4.3 Security Management**

* **Access Control**: Use Azure Active Directory for secure access management to the app service and database.
* **Firewall Rules**: Regularly review and update firewall rules for the MySQL database to restrict unauthorized access.

**5. Maintenance**

**5.1 Applying Updates**

* **Application Updates**: Pull updates from your GitHub repository and redeploy using Azure Deployment Center.
* **PHP Version Updates**: Update the PHP runtime in the App Service settings when new versions are available.
* **Database Updates**: Apply patches and updates to your Azure Database for MySQL via the Azure portal.

**5.2 Backup and Restoration**

* Ensure backups are regularly scheduled for both the app service and the database.
* In case of failure, restore from backups via the Azure portal’s **Backup** settings.

**6. Troubleshooting**

**6.1 Common Issues**

* **Database Connection Issues**:
  + Check the Connection Strings in the Azure portal and ensure they match the MySQL server credentials.
* **Deployment Failures**:
  + Review the logs in the **Deployment Center** for any errors during the deployment process.
* **Application Errors**:
  + Use **Azure Monitor** or **Application Insights** to identify and resolve issues.

**6.2 Logging and Error Tracking**

* Use the **Log Stream** in the Azure App Service to view real-time logs.
* Enable **Diagnostic Settings** to export logs to an Azure Storage Account, Event Hub, or Log Analytics.

**7. Additional Considerations**

* **Azure Security Center**: Utilize Azure Security Center for additional security recommendations and threat protection.
* **Performance Tuning**: Monitor performance metrics and adjust the App Service Plan or MySQL database configuration as needed.
* **Automated Scaling**: Consider enabling autoscaling based on traffic patterns for cost-effective resource management.