**Assignment 2: The case study of RBC bank**

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1. The appropriate security tools provided by Azure, that RBC can use?

Below are some of the security services and technologies that are pertinent to RBC's cloud journey on AWS and Azure:

* 1. **Always Encrypted with Secure Enclaves**

 This feature in **Azure SQL Database** safeguards sensitive data from malware and unauthorized users by enabling rich confidential queries. (Szymaszek, 2021)

* **Data Stays Encrypted:** Data remains encrypted even at rest within the database and during processing.
* **Authorized Access Only:** Only authorized users with the correct keys can decrypt and work with the data.
  1. **Azure Confidential Computing**

Azure Confidential Computing ensures that sensitive data remains encrypted even during processing, preventing unauthorized access. (RBC creates personalized offers while protecting data privacy with Azure confidential computing, 2022)Here's the benefit:

* **Encrypted Processing:** Even while performing calculations on sensitive information like customer details, the data stays encrypted within this secure environment. This keeps RBC's data as confidential as possible while enabling them to extract insightful information from it.
  1. **Azure Active Directory (Azure AD)**

This acts as RBC's digital gatekeeper for all their cloud applications and services. Here's how it strengthens security:

* **Single Sign-On (SSO):** Users only need to log in once to access all authorized applications.
* **Multi-Factor Authentication (MFA):** An extra layer of security requiring a second verification step beyond just a password.
* **Role-Based Access Control (RBAC):** Defines what actions different user roles (e.g., administrators, analysts) can perform within the system.
  1. **Azure Security Center**

Azure Security Center offers threat detection, vulnerability assessment, and security recommendations for Azure resources. RBC can monitor and improve the security posture of its Azure workloads using Security Center. It as a 24/7 security command center:

* **Threat Detection:** Security Center constantly scans for suspicious activity and potential security breaches.
* **Vulnerability Assessment:** It identifies weaknesses in configurations or software that could be exploited by attackers.

By leveraging these tools effectively, RBC can create a robust and secure environment for their sensitive data and applications on the Azure cloud platform.

1. If the RBC bank decided to migrate to AWS, what would be the equivalent services and security services and tools proposed.

This breakdown expands on the equivalent security services available on both Azure and AWS for RBC: (Royal Bank of Canada speeds innovation on-premises with DBaaS based on Azure Arc-enabled data services, 2021)

* 1. **Data Encryption:**
* **Azure:** Always Encrypted with Secure Enclaves provides double encryption within the database itself, ideal for highly sensitive financial data (like RBC already uses).
* **AWS:** Amazon RDS offers encryption at rest, ensuring data remains secure even if the database server is compromised.
  1. **Key Management:**
     + **Azure:** Azure Key Vault offers centralized control over encryption keys used by various Azure services.
     + **AWS:** AWS Key Management Service (KMS) allows secure creation, rotation, and access control of encryption keys used across AWS services.
  2. **Identity & Access Management (IAM):**
     + **Azure:** Azure Active Directory (Azure AD) manages user identities, enforces access policies (SSO, MFA, RBAC) for secure application access.
     + **AWS:** Amazon Cognito provides similar user management and authentication features, including user pools, federated identities, and multi-factor authentication (MFA).
  3. **Security Monitoring & Threat Detection:**
     + **Azure:** Azure Security Center acts as a central hub for monitoring security threats, vulnerabilities, and offering remediation recommendations.
     + **AWS:** Amazon GuardDuty continuously monitors AWS logs to identify suspicious activities and potential security threats.
  4. **Web Application Security:**
     + **Azure:** Azure Web Application Firewall (WAF) filters and monitors incoming web traffic, blocking malicious requests aimed at web applications. (IT & Cloud Solutions, n.d.)
     + **AWS:** AWS WAF offers equivalent protection for web applications by filtering and blocking malicious web traffic. (The Top 10 Security Tools for Your AWS Environment, 2022)

By carefully evaluating these features and considering their specific requirements, RBC can make an informed decision about which cloud platform offers the most robust and suitable security posture for their needs. (RBC creates relevant personalized offers while protecting data privacy with Azure confidential computing, 2021)

# References

*IT & Cloud Solutions*. (n.d.). Retrieved from RBCRoyal Bank: https://www.rbcroyalbank.com/business/beyond-banking/it-and-cloud-solutions.html

*RBC creates personalized offers while protecting data privacy with Azure confidential computing*. (2022, May 16). Retrieved from AccuTech International: https://accutechpro.com/microsoft-365/rbc-creates-personalized-offers-while-protecting-data-privacy-with-azure-confidential-computing/

*RBC creates relevant personalized offers while protecting data privacy with Azure confidential computing*. (2021, April 6). Retrieved from microsoft: https://customers.microsoft.com/en-us/story/1356341973555285762-royalbankofcanada-banking-capital-markets-azure

*Royal Bank of Canada speeds innovation on-premises with DBaaS based on Azure Arc-enabled data services*. (2021, October 29). Retrieved from microsoft: https://customers.microsoft.com/en-us/story/1431733508110961747-royal-bank-canada-speeds-innovation-on-premises-dbaas-based-azure-arc-enabled-data-services

Szymaszek, J. (2021, April 14). *Royal Bank of Canada using Always Encrypted with secure enclaves*. Retrieved from Microsoft: https://techcommunity.microsoft.com/t5/azure-sql-blog/royal-bank-of-canada-using-always-encrypted-with-secure-enclaves/ba-p/2260337

*The Top 10 Security Tools for Your AWS Environment*. (2022, March 27). Retrieved from Mission cloud: https://www.missioncloud.com/blog/the-top-10-security-tools-for-your-aws-environment