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Reference Architectures

2016.06.15

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Executive Overview

The Situation

Organizations wanting to migrate existing services to the cloud face a confusing landscape of decisions on how best to transform their existing architecture to a similar one within the cloud. Considerations have to be made that will balance

- application availability,
- application scalability, and
- fiscal accountability.

In addition, concerns arise about cloud-based architectures meeting the needs of secured critical assets and security compliance requirements.

The Solution

Reference architectures were developed to provide guidance on application architecture best practices to build scalable, predictable, secure applications based on AWS services. The diagrams are available in an easily-accessible place (usually via a site such as Redmine that is available to all members). One can be chosen that best meets the existing environment, but still provide the customizability to meet future design requirements.

Based on feedback and the introduction of new cloud offerings, the reference architectures will be updated and expanded upon. These updates will be made available upon completion for immediate use by organizations.

The Offering

The following sections are a list of reference solutions that have been designed to meet a wide range of customer requirements based on

- application availability,
- costs, and
- security requirements.

Security controls can be tailored to meet requirements of such security categorizations for low, moderate or high-impact values.

Entry Level

This solution is modeled as a low-cost entry-level solution for commercial off-the-shelf (COTS) applications utilizing a single availability zone. The model is suitable for a lift-and- shift of existing applications not requiring high availability.

Standard HA

This is a high-availability solution featuring multi-availability zones. The model allows for a distribution of instances across availability zones such that services can be redirected to available instances (upon failure of source instances). Amazon's database service (AWS RDS) provides high availability and failover support for database instances using multi-AZ deployments.

Hybrid

The hybrid model was designed to accommodate integration with existing data centers to leverage cloud features while maintaining on-site applications.

Hybrid Remote

This diagram is a modified version of the Hybrid model. The solution considers access from users at remote sites where connectivity is a major concern.

Development

This architecture is targeted at deploying a new mission application and includes access to the DevOps factory tools.

Data Services

This reference architecture provides a broad range of services to help you build and deploy big-data-analytics applications quickly and easily. AWS gives you fast access to flexible and low-cost IT resources. This enables the ability to rapidly scale virtually any big-data application including data warehousing, clickstream analytics, fraud detection, recommendation engines, event-driven ETL, serverless computing, and internet-of-Things (IoT) processing.

HPC Cluster

The HPC architecture utilizes Amazon's ability to scale both vertically and horizontally to meet demanding compute workloads. Horizontal scalability is provided by the elasticity of Amazon's EC2 instances; additional compute nodes can be added as needed in an automated process. Vertical scalability is provided by the wide range of EC2 instance types; instances can be transitioned to a new

instance type with more compute power. Additional features include placement groups and enhanced networking.

Conclusion

Plus3 IT has developed reference architectures that provide a starting point for organizations. The provided solutions ensure that they have a baseline architecture that meet their requirements for application availability with the ability to scale as needed in an environment that meets security compliance requirements.

These baseline references will save time for organizations as they will no longer have to devote resources to structuring a diagram of cloud services that closely match their on-premise infrastructure. The solutions can be used to jump straight into exploring extended capabilities and to researching customized features to include into the architecture.

In addition, Plus3 IT will continue to involve their customers in expanding and including other third-party products to the diagrams. Thus, enabling the customers to find ways to add to and improve upon the collection of reference architectures available to them.

With extensive knowledge about AWS services and the architectures built upon those services, our Plus3 IT engineers are on-hand to provide consultation if need be.