TAKING YOUR MUREX MX.3 PLATFORM TO THE CLOUD

CAPITAL MARKETS AND THE CLOUD

Capital markets firms are struggling to keep pace with evolving market conditions. With revenue and profits eroding, many organizations are finding that they have limited free capital to invest in new technologies. The result: they must maintain complex legacy infrastructure that is often vastly oversized, siloed and not fit for purpose.

Although fixed income, currency and commodity (FICC) businesses once dominated the landscape, in recent times their nominal revenue has fallen sharply and their share of the shrinking revenue pool has dwindled, especially in light of the rise of non-bank competitors in both primary and secondary businesses. Facing weak returns, they are also limited by capital requirements and regulatory concerns in the value they can generate for shareholders.

To meet these challenges, organizations should consider adopting a more agile operating environment and transferring technology assets outside traditional technology boundaries, leveraging innovative infrastructure such as the public cloud.

WHY MOVE TO THE CLOUD?

The cloud offers investment banks and capital markets firms a number of significant opportunities. It can enable them to:
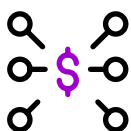
Calculate pricing and risk. Multiple cloud instances—used for multi-asset class pricing, trading risk management and regulatory risk modelling for complex derivatives based on historical and Monte Carlo methods—provide organizations with pass-by-value and pass-by-reference access to an unlimited number of parallel CPU/GPU cores.

Optimize environments. Organizations can optimize the number of environments they need—right-sizing for testing and availability, whether that is for production mirrors, pre-production, user acceptance testing, system integration testing, development, sandboxes or laboratory environments for iterative architecture.
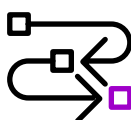
Process trades and transactions. By migrating application and database transaction tiers onto the cloud, organizations have access to increased horizontal scalability and redundancy using combinations of elastic computing, hosted databases and data services.

Migrate function-based SaaS or applications. Full stack web and componentized applications migrate well to a cloud-based environment if interfaces are decoupled and application components have stateless or well-designed stateful characteristics.

MUREX ON THE CLOUD

Organizations that use MX.3, Murex's cross-asset platform for trading, risk management and processing, can provision development and test environments within minutes, save immediate infrastructure costs for their stack, and scale grid environments up and down on-demand to hundreds or even thousands of servers, simply by adopting the cloud.

We see significant improvements in time-to-market when organizations implement Murex on the cloud—and these benefits are amplified when use of the cloud is combined with continuous integration and continuous delivery (DevOps) practices. A speedy environment provisioning from the outset will significantly contribute to the aims of DevOps and continuous integration to achieve a frequent release process of changes into test, pre-production and production environments.

Organizations facing the following challenges could particularly benefit from the cloud:

Large capital investment in infrastructure

Traditionally, enterprise platforms have a large infrastructure footprint with some organizations managing up to 100 environments with multi-terabyte database backends. Capital investments in new infrastructure are sometimes required to maintain and scale use of the platform over time.

Insufficient development environments

Organizations are constrained by the number of environments they have access to due to their cost. Inefficient time sharing of development environments can lead to long delays for new projects, development work and platform upgrades. Long provisioning times of new environments likewise are contributing negatively to project delivery timelines.

Manual environment management

Organizations often struggle with the availability of appropriate tools to manage so many complex environments effectively. Processes remain manual and prone to human error, which leads to delays in deployment of new functionality and additional defects.

Limited DevOps enablement

Without full stack environment build automation, organizations are unable to implement effective continuous integration and delivery. New environments can take up to two months to be manually provisioned on-premise—a DevOps anti-pattern.

Risk Engine, Grid Computer flexibility

Risk Engine is powered by a large fleet of servers (a grid) provisioned for peak usage but which may sit idle for hours each day. This server fleet must also be maintained and refreshed with new hardware (every three years) in line with evolving regulatory and risk requirements that require more raw computing power.

WHAT BENEFITS COULD ORGANIZATIONS SEE?

Organizations that leverage public cloud-native technologies could also see improvements in the following areas:

Acceleration

Enable one-click deployment of new environments on a pay-as-you-go model. Using cloud-based APIs and automation, new environments can be deployed in as little as 15 minutes. That means faster time-to-market for new projects, products and regulatory requirements, and the ability to increase the number of environments as necessary.
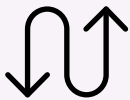
Elasticity

Leverage hyper-scale elastic computing capacity to perform more sophisticated risk management and to dramatically speed up end of day and end of month processing while operating at a lower total cost of ownership compared with on-premise environments.

Cost savings

Eliminate capital expenditure on infrastructure and maintenance costs while having access to evergreen infrastructure on the cloud. Scale environments up and down as needed. Provide full transparency on costs for environments and enable detailed end-to-end cost metering and show back/charge back on a user, project or business unit level.

Simplification

Amazon Web Services (AWS) and Microsoft Azure offer programmatic (API) access to infrastructure that allows applications to be codified into templates and then provisioned on demand and managed as independent stacks. This provides for more simplified management and a real-time, consolidated view of the organization's infrastructure. These can be easily integrated with cloud-native management and monitoring tools.

CLOUD DEPLOYMENT PATTERNS

Organizations could deploy aspects of Murex on the cloud in a number of ways. We recommend organizations consider beginning with the following high-value, low-risk options:

1. Development Environment Build Automation and Cloud Hosting
2. Grid Compute/Risk Engine on the Cloud

The first pattern involves turning Murex development environments into infrastructure-as-code templates that deploy the cloud infrastructure, database engine, application binaries and the associated configuration.

Organizations will also need configured network connectivity between the cloud provider and their data center using either a private network or Internet/VPN, depending on their performance and information security requirements. They could deploy new development environments via the command line, using the Self Service Portal or through IT service management (ITSM) tools in an on-demand fashion.

**Development Environment Build Automation & Cloud Hosting
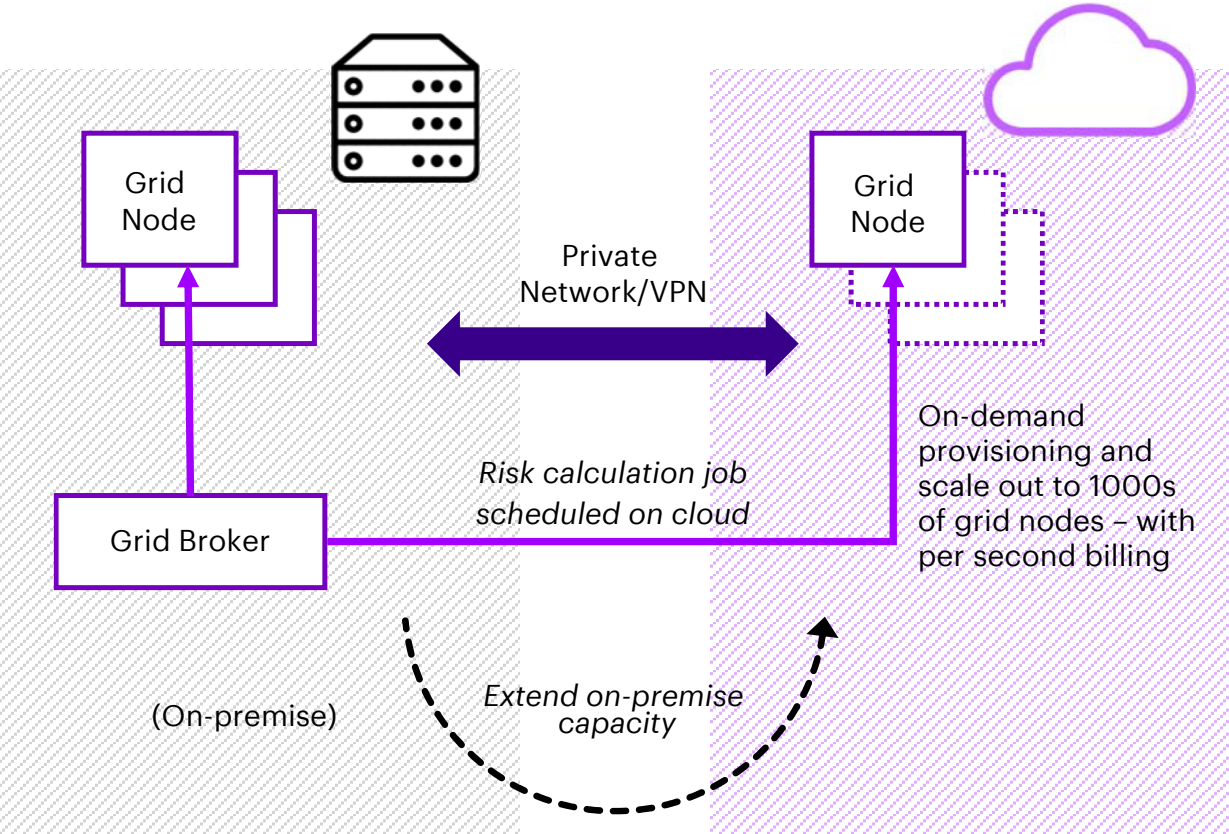(Minimum Viable Product - MVP)**
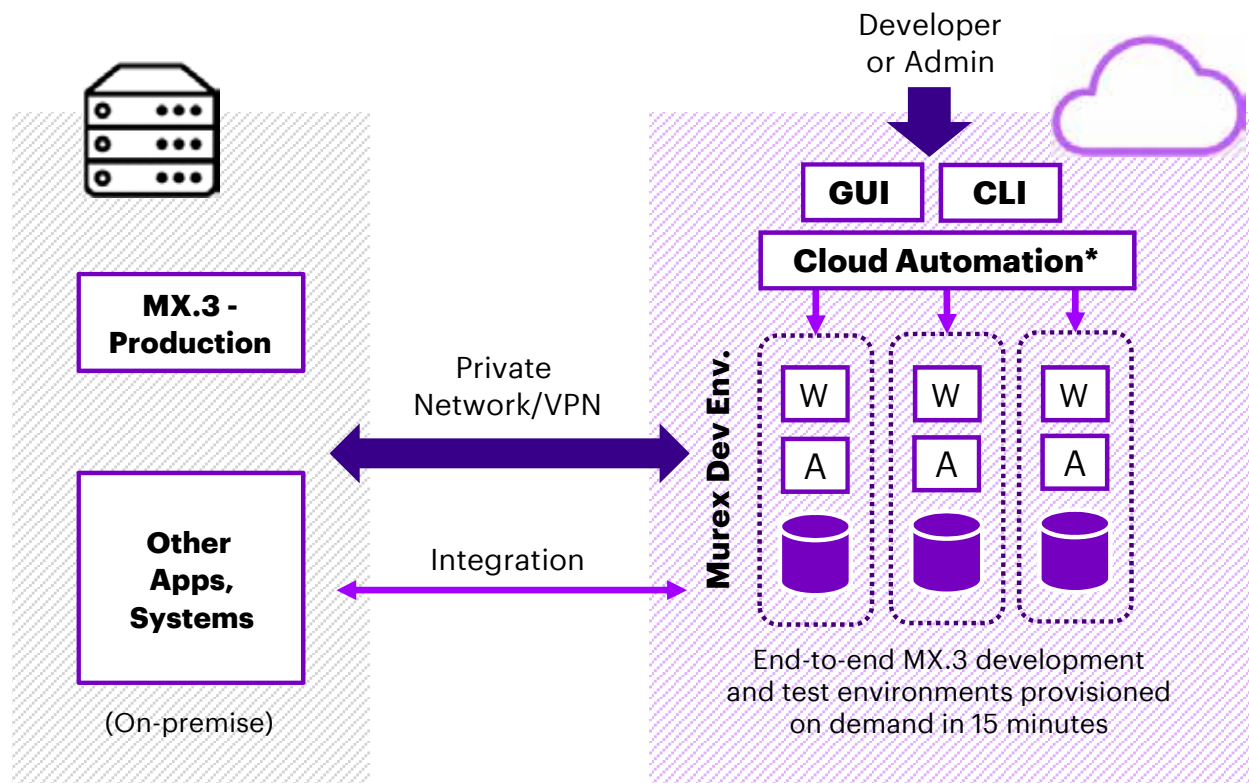
* Hashicorp Terraform, AWS Cloud Formation & Azure Resource Manager

Source: Accenture

The second pattern involves deploying the production grid compute/risk engine components (such as IBM Platform Symphony or Tibco DataSynapse) to the cloud provider. With this pattern, organizations could enjoy the instant, horizontal, cost-effective compute scalability that the cloud offers and either extend (burst) or replace on-premise capacity.

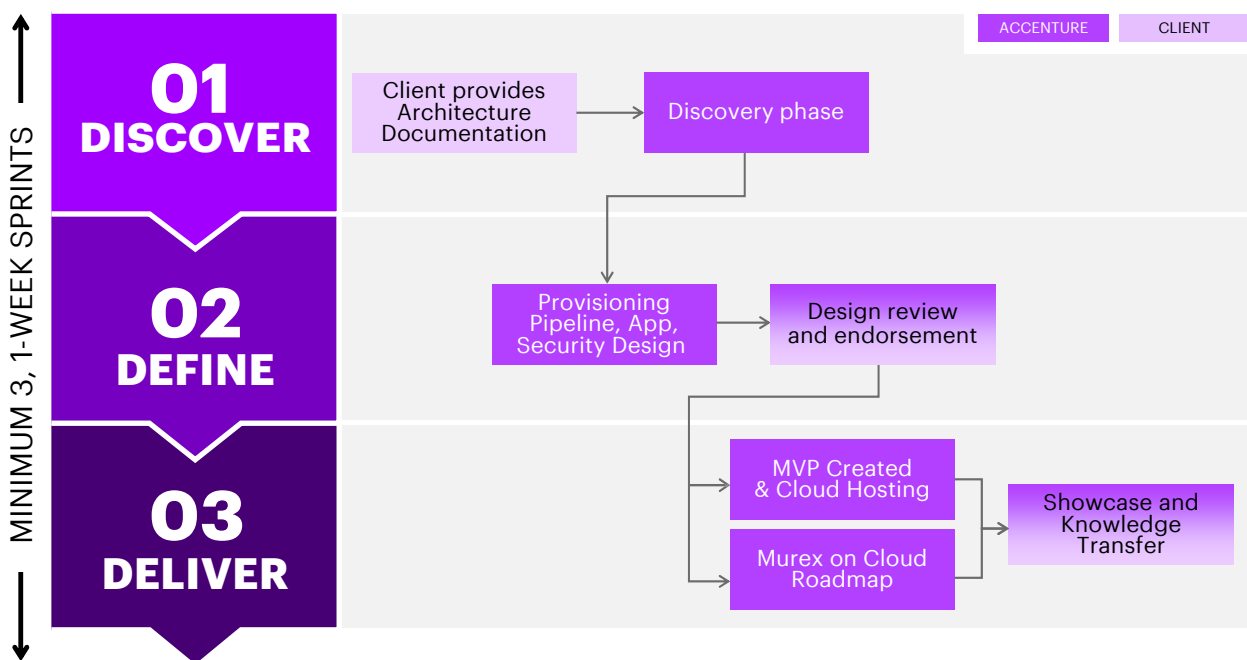**Grid Compute/Risk Engine on the Cloud**

Grid Node

Private
Network/VPN

Grid Node

Risk calculation job scheduled on cloud

On-demand provisioning and scale out to 1000s of grid nodes – with per second billing

Grid Broker

(On-premise)

Extend on-premise capacity

IBM Platform Symphony & Tibco DataSynapse supported

Source: Accenture

ACCENTURE'S DELIVERY APPROACH

To help organizations take advantage of MX.3 on the cloud as quickly as possible, we use an agile delivery model and follow a phased approach. Phase 1 is about discovery, definition and delivery, completed in a minimum of three, one-week sprints before we move to the next phase on the roadmap.

MINIMUM 3, 1-WEEK SPRINTS

01 DISCOVER

02 DEFINE

03 DELIVER

ACCENTURE   CLIENT

Client provides Architecture Documentation → Discovery phase

Provisioning Pipeline, App, Security Design → Design review and endorsement

MVP Created & Cloud Hosting

Murex on Cloud Roadmap

Showcase and Knowledge Transfer

Source: Accenture

1. Discover

In this first step, we review the architecture, integration, configuration practices, tools and deployment pipeline, and analyze security and data masking practices to identify any pain points. By the time we have completed these activities, we understand the current state and the requirements for the detailed design, and have documented current state architecture and deployment practices.

2. Define

Next, we define and design the provisioning pipeline using cloud-native tools, specify which environments are in scope and identify use cases. The outcomes of this step include a detailed design of the pipeline, application architecture and security architecture.
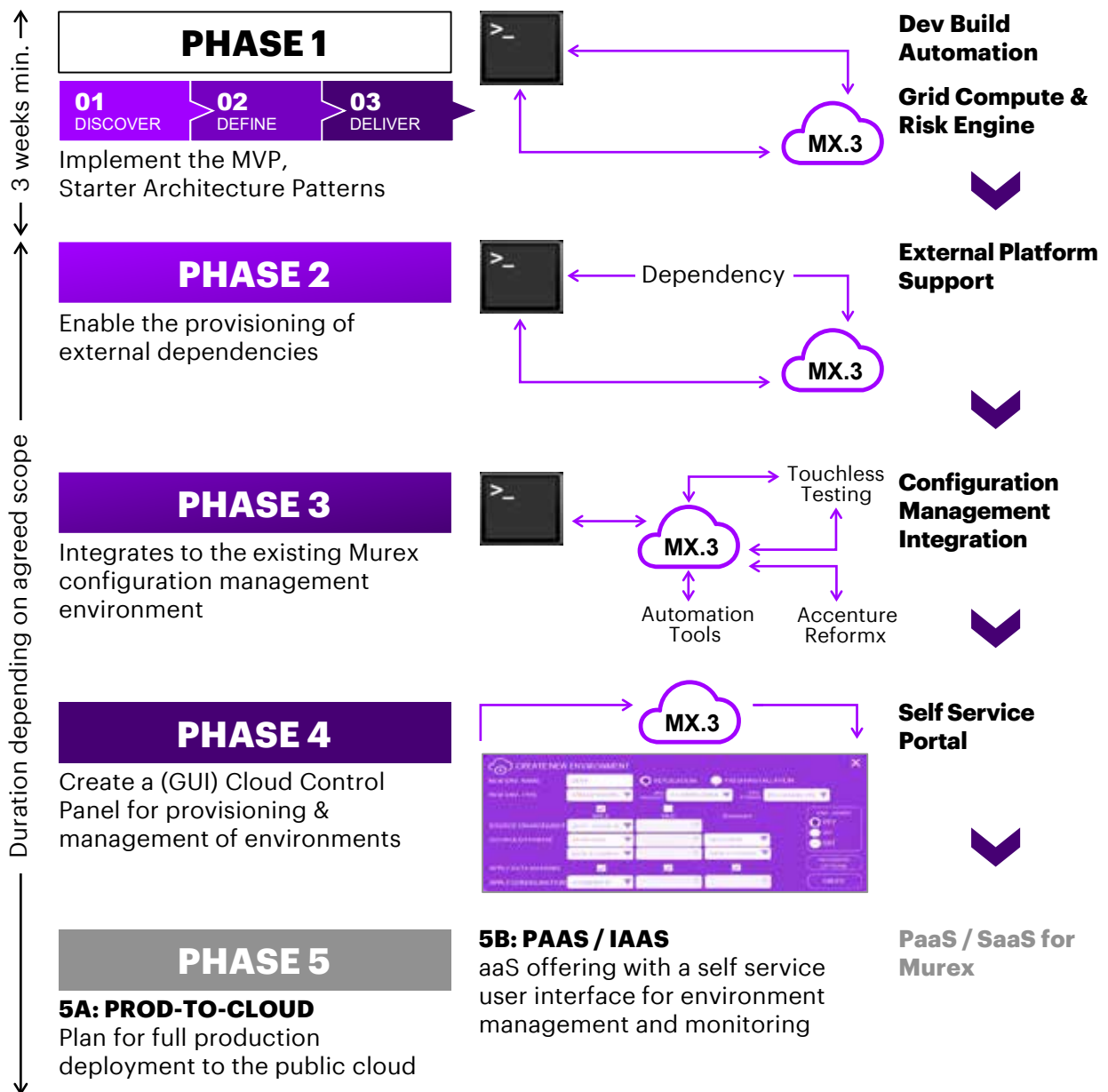
3. Deliver

Our final step in Phase 1 is to develop build automation scripts, test tool and script integration, and create a roadmap for the desired target state. We test the pipeline for on demand provisioning of the development environment in AWS/Azure and develop a roadmap for operational readiness, including a backlog list of future enhancements.

Once we have completed Phase 1, it's time to advance to Phase 2 and beyond.

ROADMAP FOR MUREX ON THE CLOUD

Phase 2 of the roadmap involves enabling the provisioning of external dependencies. In Phase 3, we integrate with the existing Murex configuration management environment. And in Phase 4, we develop a cloud control panel for provisioning and management of the environments. Finally, in Phase 5, we plan for the full production deployment to the public cloud. There's also the potential in this phase for organizations to take advantage of our PaaS and IaaS services with a self-service user interface for environment management and monitoring.

PHASE 1

01 DISCOVER **02** DEFINE **03** DELIVER

Implement the MVP, Starter Architecture Patterns

MX.3

Dev Build Automation

Grid Compute & Risk Engine

PHASE 2

Enable the provisioning of external dependencies

Dependency

MX.3

External Platform Support

PHASE 3

Integrates to the existing Murex configuration management environment

Touchless Testing

MX.3

Automation Tools

Accenture Reformx

Configuration Management Integration

PHASE 4

Create a (GUI) Cloud Control Panel for provisioning & management of environments

MX.3

Self Service Portal

PHASE 5

5A: PROD-TO-CLOUD
Plan for full production deployment to the public cloud

5B: PAAS / IAAS
aaS offering with a self service user interface for environment management and monitoring

PaaS / SaaS for Murex

3 weeks min.

Duration depending on agreed scope

Source: Accenture

MUREX ON THE CLOUD ENABLES CONTINUOUS INTEGRATION AND DELIVERY

We also recommend using a DevOps framework. This could enable continuous integration and delivery, reduced complexity and faster resolution of issues, leading to a more stable operating environment and more time for teams to innovate.

In particular, a cloud-enabled environment provisioning can bring significant potential benefits in the initiating development phase with the rapid creation of environments, as well as throughout subsequent phases that rely on frequent environment changes and updates, such as testing. The optimization that cloud enablement can bring—including the dynamic, seamless and consistent allocation of resources—can dramatically speed up the development process.

MX.3 **Murex DevOps Framework**

	PROCESS	TOOLS
DEVELOPMENT	Creation of Murex environments to start development using a correct baseline	Cloud provisioning using Terraform, CloudFormation or Resource Manager and app install using Puppet or Ansible
SOURCE CONTROL	Development environment integrated to source code repository	• Supported configurations stored in Accenture Reformx and Git • Sonar for supported codes • Manual code review
CODE QUALITY & REVIEW		
PACKAGE	Predefined build cycles and testing of code submissions tracked throughout the SDLC workflow	• Supported configurations deployed via Accenture Reformx • Automated Test Runs using Murex MXTEST
DEPLOY		
TESTING	Quality gates enforced using reusable and standardized tests against predefined components	• Murex MXTEST • QTP, Tosca for integration test with other applications
RELEASE	Managed roll-out of new features post testing	• Predictive automated monitoring using Accenture MxMon

Source: Accenture

GENERAL CONSIDERATIONS FOR CLOUD INITIATIVES IN CAPITAL MARKETS

In the capital markets industry, when it comes to choosing the right approach, it's important to understand the regulatory landscape and the organization's appetite for risk. Organizations should consider the business case and sponsorship model, and the operating model for cloud enablement across all the different business functions. Developing a plan for educating stakeholders across the organization is also key.

The cloud provider strategy is another area for consideration—whether to choose a single-cloud or multi-cloud strategy is based on factors such as the organization's need for redundancy, and advantages of speed and capacity in some geographies. Also, organizations need to determine whether they will use cloud agnostic software or cloud solution provider specific (PaaS) services.

Organizations must also decide on a data strategy. How is their data classified (how sensitive is it), and which legal entities or jurisdictions affect their business? Will data be short or long-lived on the cloud?

Finally, we recommend organizations consider standards for centralization of platform access, security (IAM, network, data encryption, key management, controls), application architecture patterns, resilience and performance patterns, a migration approach and level of non cloud-native debt, automation and DevSecOps, to incorporate security at scale.

WHY ACCENTURE?

Accenture is Murex's only global alliance partner. With 20 years of experience collaborating on Murex projects, we have more than 900 skilled Murex professionals locally and worldwide, enabling our team to provide onshore, nearshore and offshore delivery capacity as required. In the last 10 years alone, we have helped more than 40 capital markets firms with their Murex implementation projects. We are also proud to have built both the leading configuration management tool for Murex, Accenture Reformx, and the monitoring tool, Accenture MxMon.

In terms of our cloud credentials, we are part of a diverse cloud ecosystem. We have established relationships with all cloud providers, including AWS and Microsoft Azure. With our team of more than 31,000 skilled cloud professionals, we have delivered 20,000 cloud projects for clients in nearly every industry and geographic region around the globe, including more than 75 percent of Fortune Global 100 companies. Our strong footprint is supported by more than 40 innovation and delivery centers across 40 industries.

MUREX ON THE CLOUD: COMMON QUESTIONS

In any Murex to cloud journey, a number of common questions arise:

1

Which cloud providers are supported?

Murex is currently certified for Microsoft Azure and Amazon Web Services (AWS).

2

What are the prerequisites?

Murex version MX.3.1.35+ on RedHat Linux RHEL 7.2+ and both Oracle and Sybase back-ends are currently supported. Please check with your Murex representative for technical details and Murex cloud licensing policy.

3

Are there regulatory compliance considerations?

Every country regulator is at a different stage with respect to their direction on public cloud use. However, development and test environments are usually low risk and do not typically contain PII or highly confidential data, making them unlikely to sound alarm bells with regulators. Accenture also has technology risk specialists who can discuss proven approaches and can provide support during conversations with regulators.

4

Is this a cookie cutter approach?

Yes and no. The build automation artifacts we have created to deploy environments should be able to slot into most of our clients' pipelines. The invocation methods and testing may vary. We will work with you to adapt to your environment during the discovery phase.

5

Could I get the same benefits from my private cloud?

The benefits of scalability, reduced capital expenditure, pay-as-you-go usage, the ability to launch new environments in any country that has a public cloud region, and end-to-end automated provisioning are really only available in the public cloud. Implementing this on a private cloud may improve automation, but not likely to the same degree as the public cloud.

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For more information about our Murex capabilities, visit www.accenture.com/tradingplatforms

To find out about Murex's MX.3 platform for capital markets, go to www.murex.com or email info@murex.com

ABOUT ACCENTURE

Accenture is a leading global professional services company, providing a broad range of services and solutions in strategy, consulting, digital, technology and operations. Combining unmatched experience and specialized skills across more than 40 industries and all business functions—underpinned by the world's largest delivery network—Accenture works at the intersection of business and technology to help clients improve their performance and create sustainable value for their stakeholders. With approximately 442,000 people serving clients in more than 120 countries, Accenture drives innovation to improve the way the world works and lives.
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