



APPLICATION PORTFOLIO
CLOUD TRANSFORMATION
TO AWS CLOUD BY LEVERAGING
AMAZE® FOR APPLICATIONS



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1. ABSTRACT

Cloud transformation can be tricky and expensive if your approach is not aligned with your cloud readiness and business requirements. Though there are various ways to move your legacy applications from on-premises to the cloud, each approach has its own challenges. This whitepaper talks in detail about such application cloud migration and modernization approaches like rehosting, rearchitecting, and replatforming. It further takes a deep dive into our replatforming approach and shows how amaze® for Applications, Hexaware's proprietary application cloud replatforming product suite, gives a competitive edge with rapid cloud migration and significant TCO reduction.





2. CLOUD ADOPTION



For IT-enabled organizations, the cloud is perhaps not an option anymore and may have already become a mandate as a part of their digital journey. Most of them may be already in the middle of their cloud transformation journey and looking beyond high availability, high performance, operational simplification, etc.

The high-performance software tools and platforms hosted on “*pay-per-use*” cloud environments (integrated with cloud AI, ML, high throughput messaging, and streaming) are becoming the new IT environment, thereby enabling advanced applications to achieve a competitive edge in their cloud migration.

In the advanced and integrated cloud environments like AWS, there seems to be no place for large commercial middleware and databases. Most of the cloud environments are already seeing the transition from large commercial application platforms to lightweight open-standard/open-source integration-ready software tools/platforms that can scale massively with “*pay-per-use*” cloud environments.

Such mass cloud adoption can result in a significant decrease in the application software licensing cost and realize huge TCO reduction by leveraging a strategic cost takeout model for application portfolio cloud transformation.

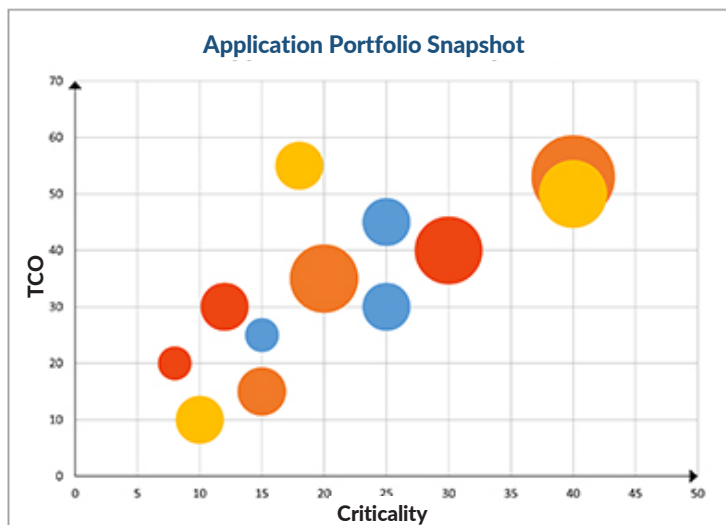


Fig 1: Before Applying Cost Takeout Model

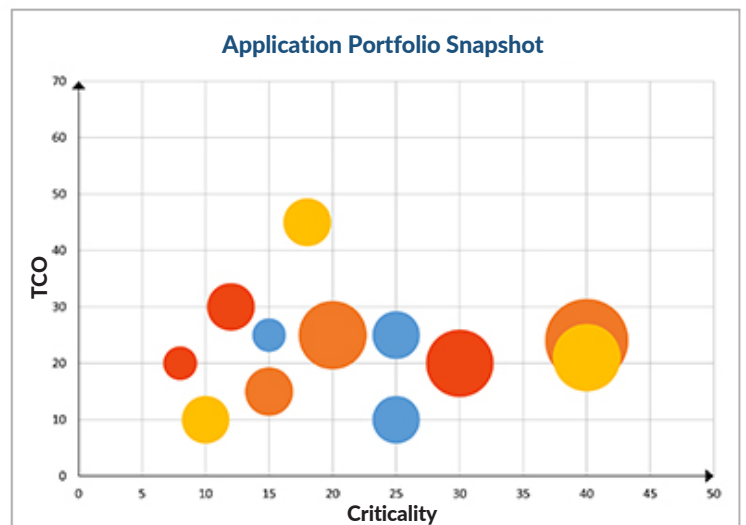


Fig 2: After Applying Cost Takeout Model



3. APPLICATION PORTFOLIO CLOUD TRANSFORMATION CHALLENGES

For IT-enabled businesses, this may be the right time to ride the cloud wave and embrace the cloud for resilience and stay ahead of the curve. The question that arises now is whether the cloud migration requires significant investment and time? Migrating bulk legacy applications to the cloud/ mass cloud adoption to open-standard/open-source technology platforms on a “*pay-per-use*” highly scalable IT environment is not that simple. Some of the challenges of legacy application portfolio cloud modernization are as follows:

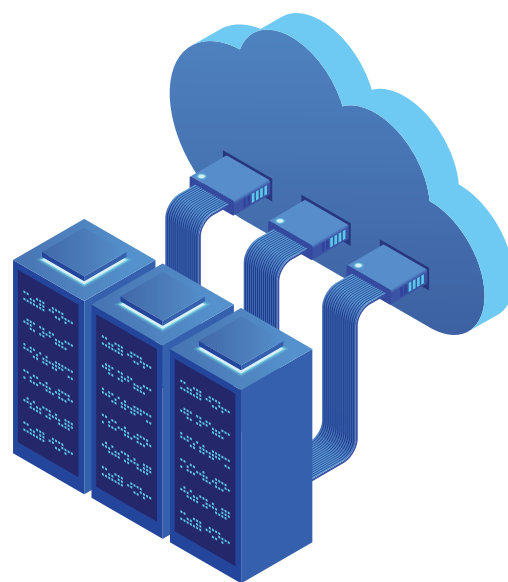
- How do I keep a balance between the risks, costs, and timelines while completing the process of cloud migration?
- What is the right cloud migration approach - rehost, replatform, or rearchitect?
- Which cloud to go for - single/multi/hybrid?
- Is it possible to go cloud native with an option to migrate to some other cloud in the future without rewrite?
- Managing complex applications that are more than 7 years old, SMEs unavailability
- Which application modernization strategy will give the maximum TCO savings?
- Which approach will increase the productivity for future releases?
- Which approach will protect my investment and help accelerate digital enablement?



4. APPLICATION PORTFOLIO CLOUD TRANSFORMATION AS REHOSTING

Quite often, enterprises evaluate the rehost (lift-and-shift) option first for their cloud migration due to its cost advantages and the speed of implementation. However, on realizing that this option does not perform well for all the key parameters, they understand the limitations of rehosting as mentioned below:

- The application portfolio's infra remains nearly the same (unless optimized) as was in the on-premises. This results in a similar or minimal cost benefit from the infrastructure.
- The mass cloud migration of legacy monolithic applications as-is is generally done by retaining the same application software platforms (application server/ middleware and database servers). Hence, rehosting may not result in any substantial software license savings. In a few scenarios for the legacy applications on commercial large on-premises application software platforms, this may add even more complexity on the cloud.
- Rehosting of monolithic applications as-is does not result in agility and high velocity releases (a feature of cloud) because of the monolithic nature of the legacy applications where DevOps releases may be mostly at the complete application level.
- The digital initiatives of the IT-enabled organizations may not have an easy integration unless all the applications in the portfolio are integration-ready.





5. APPLICATION PORTFOLIO CLOUD TRANSFORMATION AS REARCHITECTING

Enterprises often evaluate the rearchitect (rewrite) option at the other extremity to leverage the true benefits of cloud. However, rearchitecting/rewriting a legacy applications portfolio to cloud native is no easy task. This will not only involve a significant effort/budget, but also introduce the risk of re-stabilizing the entire portfolio, thereby resulting in a severe impact on the business continuity. Here are some of the limitations of rearchitect/rewrite:

- Significant planning, effort, and budget required for rewriting even a mid-size legacy application portfolio to a cloud native architecture.
- The IT-enabled organization's technology team may require significant re-skilling to gain enough expertise to adopt the cloud native application best practices.
- Modernizing from a legacy to cloud native architecture may span beyond technology and may require a rethinking of the IT and business processes. It may even be linked to a cultural change.
- Enough documentation/ legacy application SMEs may not be available for providing all the business & technology details required to rearchitect/rewrite as per the cloud native architecture best practices.
- If the IT resources engaged in supporting business-as-usual are tasked with this complex and daunting mission, the business continuity may get disturbed.
- In case the business has siloed business units, a lack of umbrella leadership may deter the enterprise's digital initiatives, collaboration being a key element of cloud transformation.



6. APPLICATION PORTFOLIO CLOUD TRANSFORMATION AS REPLATFORMING

Cloud modernization/replatforming often acts as a middle path between these two extremes, i.e. rehost and rearchitect. It suits best for mid to large IT-enabled organizations for their mass cloud migration journey. Below are some of the key features of such a cloud modernization solution:

- Replatform the applications portfolio from heavy and costly commercial application platforms, middleware, and databases to lightweight pay-per-use cloud application platforms, middleware, and databases.
- Decouple the applications portfolio user interfaces and business logic and refactor the application business layers from legacy interfaces to cloud native best practices and cloud platforms.
- Enable API of all the business logic, enable seamless integration with other applications in the portfolio and the advanced cloud solutions.
- Enable API gateway for seamless integration with any enterprise digital initiatives.
- Enable API security for secure cloud native business service access.
- Enable containerization of the cloud native business services for high availability, scalability, and performance.
- Enable continuous development and continuous integration for the applications in the portfolio for high release velocities catering to the cloud native application principles.
- Accelerate digital enablement through omnichannel user experience integrated seamlessly with the applications in the portfolio over the newly introduced API.

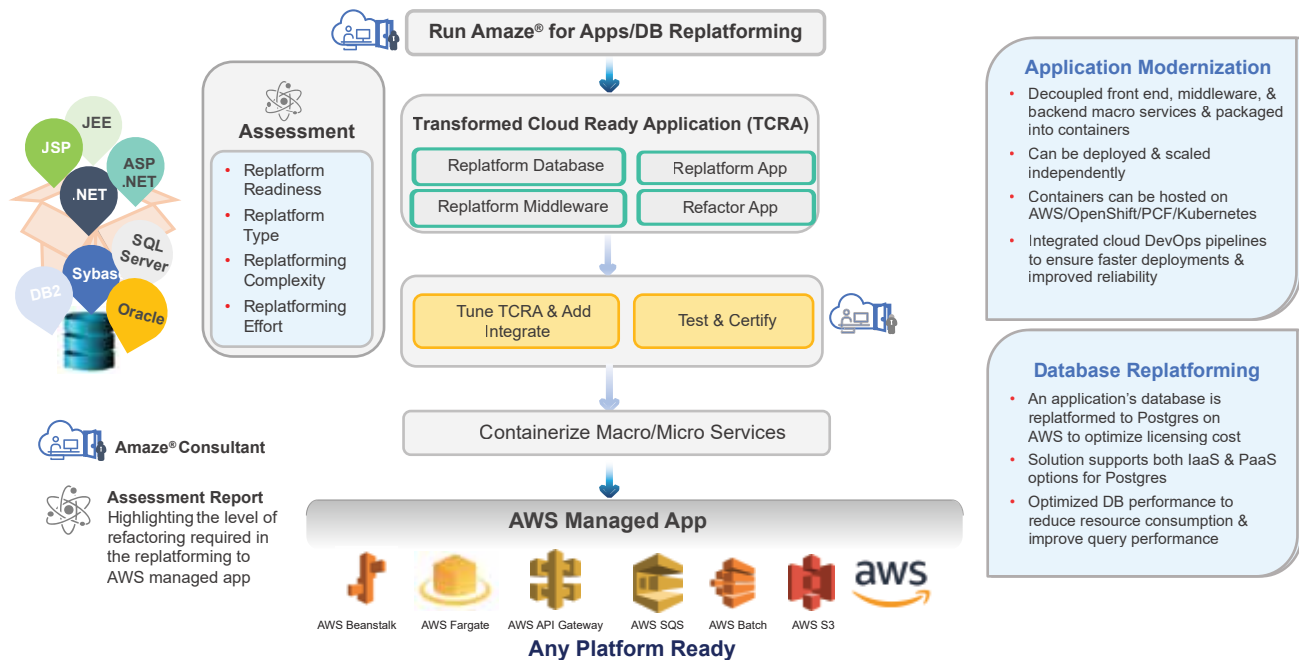




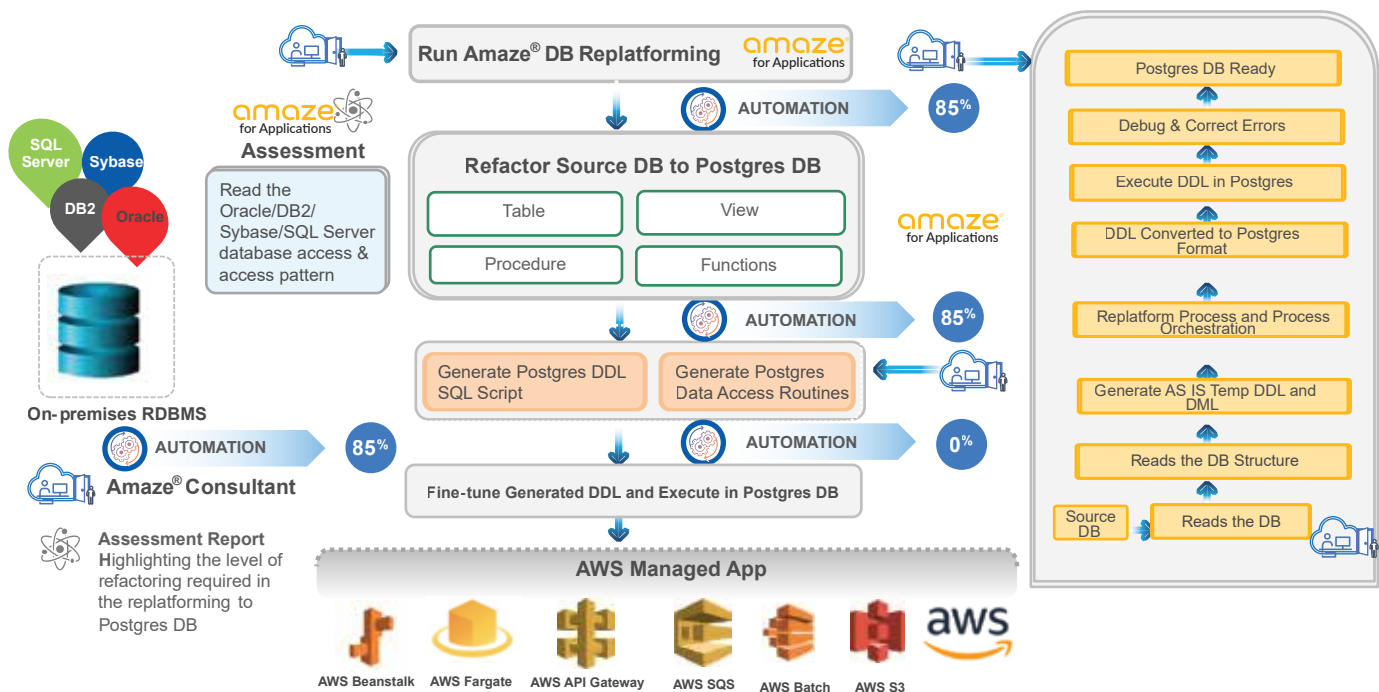
7. HEXAWARE AMAZE® APPLICATION PORTFOLIO CLOUD TRANSFORMATION TO AWS

Hexaware's amaze® for Applications adopts the mid-path of cloud replatforming with AI-based extreme automation enabling up to 70% faster mass AWS cloud modernization with up to 60% TCO reduction. It is suitable for mid to large IT-enabled organizations for their mass cloud migration journey.

Amaze® for Applications for AWS Cloud



TIBCO BW to AWS Cloud Native Execution Steps



Amaze® for Applications enables mass cloud modernization of legacy Java and .NET custom business applications, and TIBCO Business Works applications, and the related databases (Oracle, Sybase, DB2, and SQL Server) up to 60% faster. It also results in TCO reduction of up to 70% through replatforming of heavy & costly commercial application platforms, middleware, and databases to open-source/open-standard AWS cloud PaaS solutions.

Hexaware Amaze® App Modernization/Cloud Transformation Catalog for AWS

On-premises Technology	App Modernization/ Cloud Transformation to Cloud Native App with CI/CD on Private/Public Cloud			
	VM/ Kubernetes/ PCF/ OpenShift	AWS ECS	AWS Fargate/ Lambda	AWS EKS
 ASP.NET, Razor, SPA, .NET Legacy, WCF Web Service, Messaging, Batch, ADO, Entity Framework, Telerik on IIS	Decoupled as-is ASP.NET, Razor,SPA front-end integrated with macro business services with Rest/SOAP,messaging,batch endpoint with ADO.NET, entity framework on .NET Core 3.15/5.0 with CI/CD on Kestral/IIS			
 JSP, Servlets, JSF, Struts, SPA, EJB, Web Services, Messaging, ORM, Batch on WebLogic/WebSphere	Decoupled as-is JSP,Servlets,JSF,Struts, SPA front-end integrated with macro business services with Rest/SOAP, messaging,batch endpoint with ORM framework SpringBoot on Tomcat/Spring Batch on Java1.8+ with CI/CD			
	Macro business services with Rest/SOAP, messaging, batch endpoint with ORM framework Spring Boot integration on Java1.8+ with CI/CD			
Microsoft Message Queuing 	TIBCO MQ/ IBM MQ/ Sonic MQ/ Active MQ	Active MQ/ SQS	Active MQ/ SQS	Active MQ/ SQS
Schedulers  	Autosys/ Control-M /Quartz	AWS Batch	AWS Batch	AWS Batch
Database    	Oracle/ DB2/ Sybase/ SQL Server/ Postgres	AWS Postgres/ AWS Aurora Postgres	AWS Postgres/ AWS Aurora Postgres	AWS Postgres/ AWS Aurora Postgres

Cloud Modernization Catalog

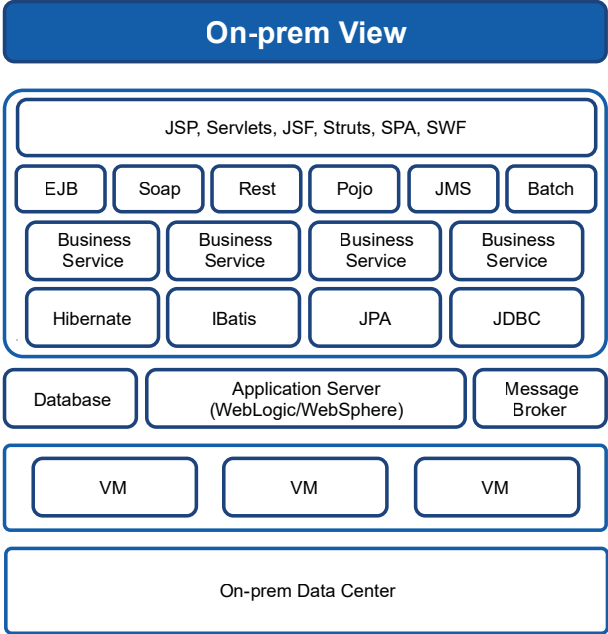
Application		Database			
On-premises Technology		AWS PaaS	AWS RDS	AWS Aurora Postgres	AWS SQL Server
	IIS	✓	✓	✓	✓
	WebLogic, WebSphere, Jboss	✓	✓	✓	✓
	IBM WebSphere ESB	✓	✓	✓	✓
		✓	✓	✓	✓
Microsoft Message Queuing 		✓	✓	✓	✓

 AUTOMATION
  AUTOMATION

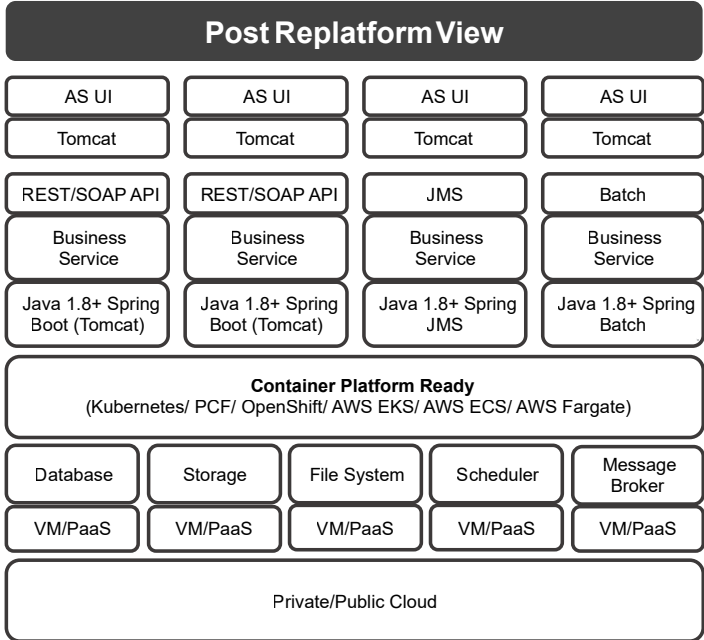
 70%
  70%
  70%

Amaze® for Applications enables true cloud transformation by modernizing the on-premises applications portfolio architecture to work with the AWS PaaS platform. Amaze® for Applications can not only modernize on-premises applications to the AWS cloud, but also help transform the existing on-premises application portfolio to a virtual private cloud, public cloud, or multi-cloud suitable for true hybrid cloud and minimal vendor lock-in.

Hexaware Amaze® App Modernization/Cloud Transformation Reference Architecture for Java Web Application

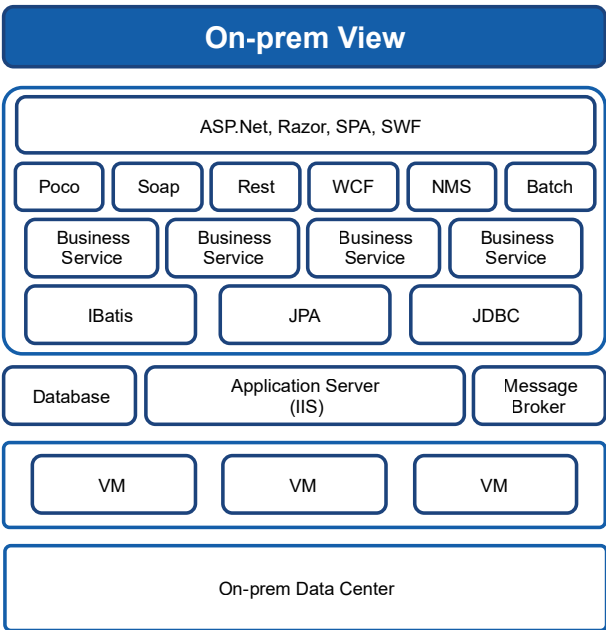


- Application availability dependent on hardware redundancy
- Application scalability limited to hardware horizontal/vertical scaling
- High commercial app platform (app server) cost

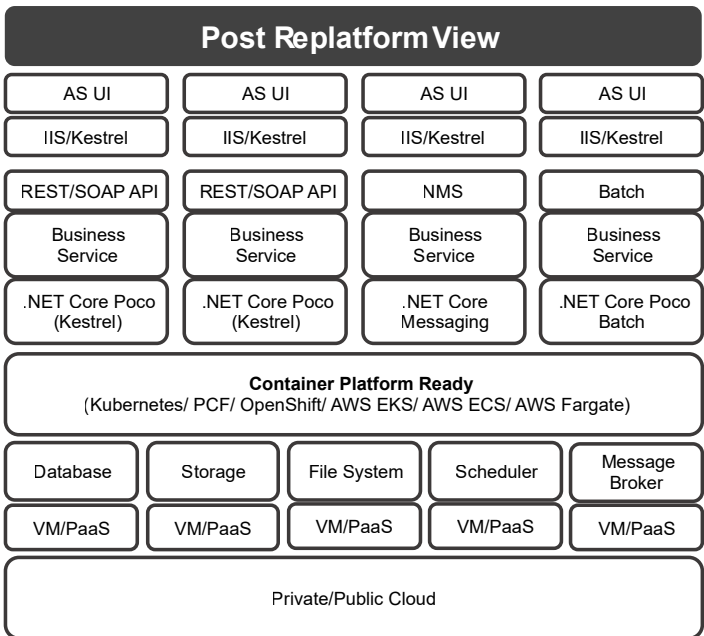


- Application availability dependent on container platform
- Application scalability increases by container instance
- Non-commercial app server cost (Tomcat)

Hexaware Amaze® App Modernization/Cloud Transformation Reference Architecture for .NET Web Application



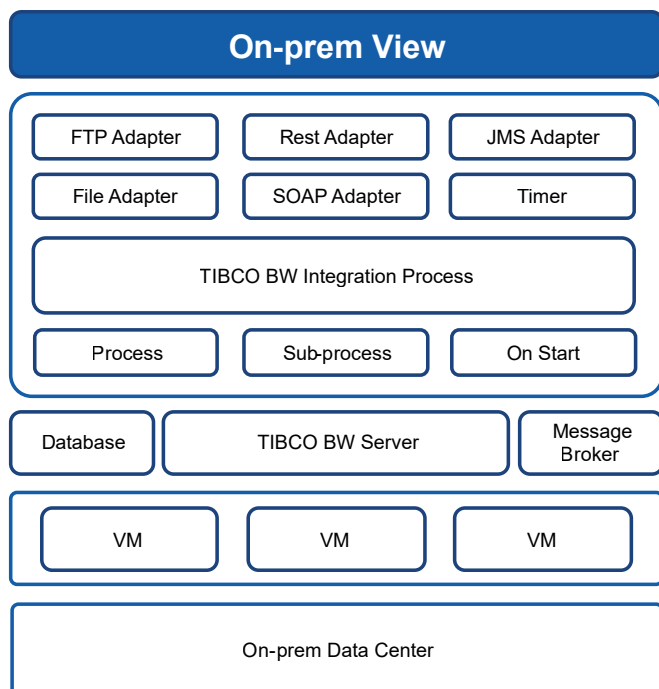
- Application availability dependent on hardware redundancy
- Application scalability limited to hardware horizontal/vertical scaling
- High commercial app platform (app server) cost



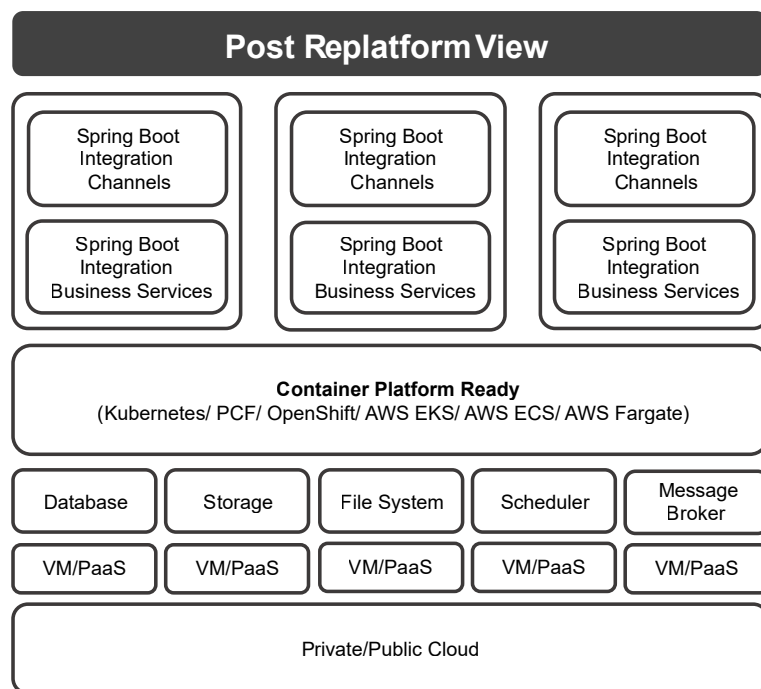
- Application availability dependent on container platform
- Application scalability increases by container instance
- Non-commercial app server cost (Kestrel)



Hexaware Amaze® App Modernization/Cloud Transformation Reference Architecture for TIBCO BW Application



- Application availability dependent on hardware redundancy
- Application scalability limited to hardware horizontal/vertical scaling
- High commercial integration platform cost



- Application availability dependent on container platform
- Application scalability increases by container instance
- Non-commercial integration platform

HOW TO GET STARTED

Amaze® for Applications is best suited for enterprises with a goal to cloud transform a portfolio of 30+ applications to any private/public/hybrid cloud over a time period of 12 to 18 months. A typical amaze® for Applications engagement is a 4-step model - solution workshop, cloud transformation readiness assessment, pilot, and portfolio cloud transformation execution. The execution steps include delivery, handover, and warranty support in groups/waves. These steps are explained in the next section.

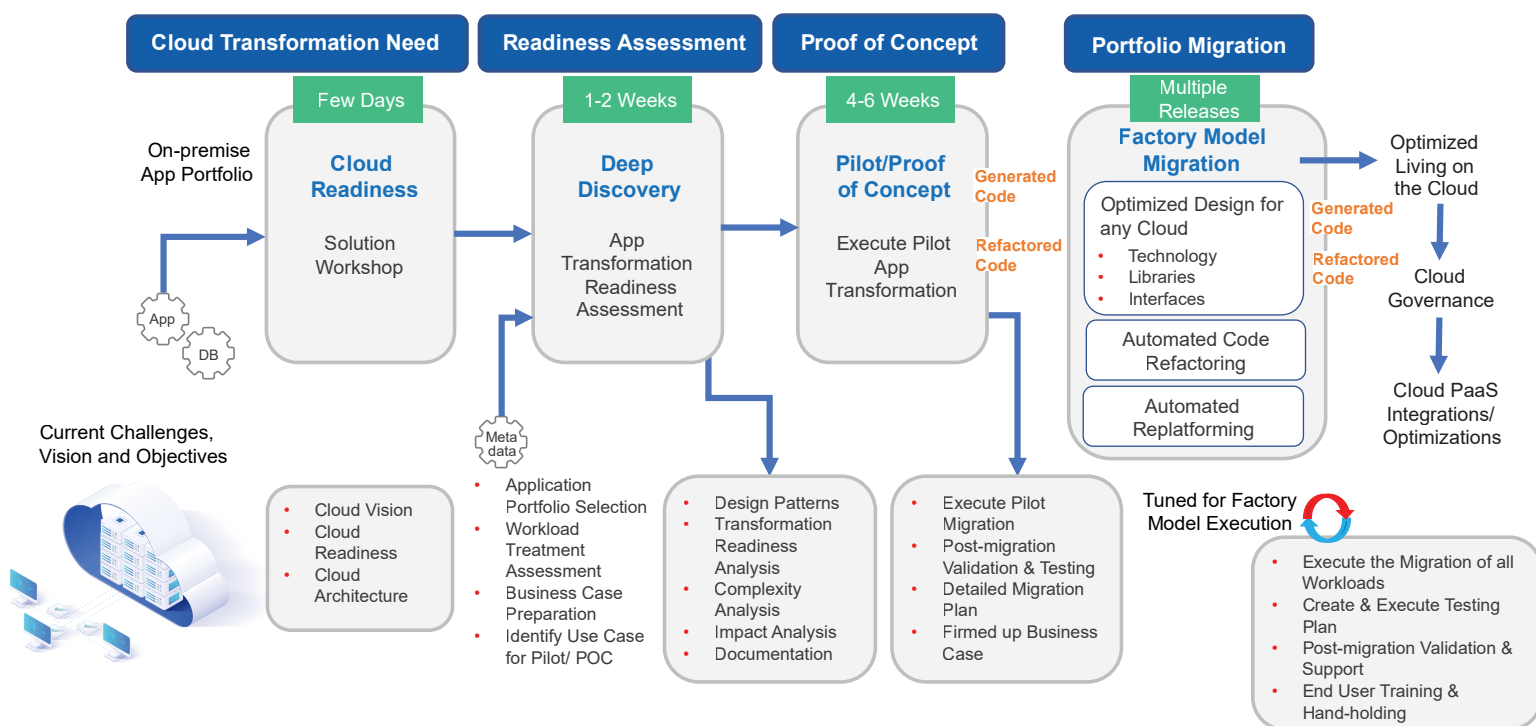


8. APPLICATION PORTFOLIO CLOUD TRANSFORMATION STEPS AT HEXAWARE

Hexaware's solution for mass cloud modernization/transformation of on-premises applications portfolio is a 4-step process that starts with a solution workshop followed by a cloud transformation readiness assessment, and then the pilot of a sample client application.



On the successful execution of the pilot, the remaining applications in the portfolio are cloud transformed using a factory model followed by the handover of the transformed applications to the client's application teams.



STEP 1 – CLOUD TRANSFORMATION SOLUTION WORKSHOP

Hexaware's mass cloud modernization/transformation workshop is a collaborative session to understand the client's cloud vision, cloud readiness, enterprise architecture standards, and most importantly the business and technical expectations from the cloud transformation.

STEP 2 – CLOUD TRANSFORMATION READINESS ASSESSMENT

One of the most important tasks in the cloud transformation is to understand the cloud readiness of the applications in the portfolio and know the quantum of changes the applications will have to undergo. It also helps to assess the associated risks, costs, and timelines as well as the impact on other dependent applications.

Traditionally, this was done as a manual activity and took a significant amount of time, considering a typical developer's productivity for assessment being around 20,000 lines of code per day. It would take several weeks to complete an assessment of a medium-sized application with 300,000 lines of code. With amaze® for Applications, the assessment can be completed easily in minutes or an hour in most cases. After the assessment is completed, amaze® for Applications produces an interactive report in HTML format with drill-down features providing in-depth details in the relevant areas.



Application Snapshot

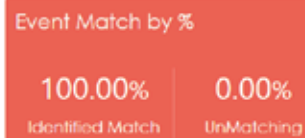
Event Matches

Connector Matches

Macro API Candidates

Micro API Candidates

Event Matches



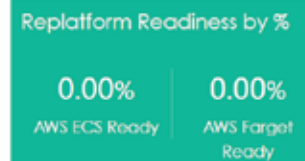
Connector Matches



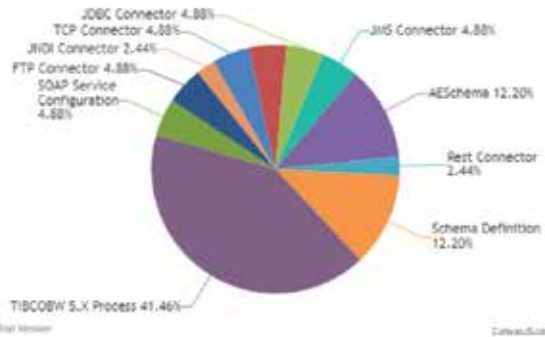
MsgBroker Replatform Readiness



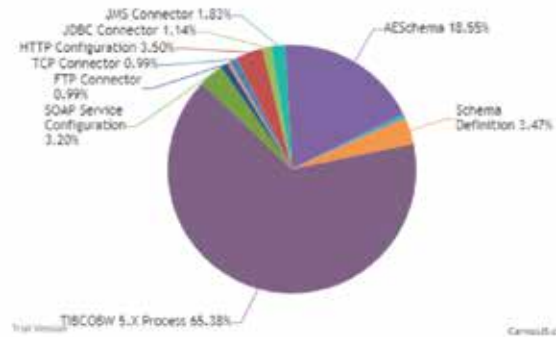
Batch Replatform Readiness



Application Technology Spread (# Files)



Application Technology Spread (# LoC)



Scheduler RePlatform Readiness



DB RePlatform Readiness



FTP Replatform Readiness



Macro/Micro API Readiness



STEP 3 – CLOUD TRANSFORMATION PILOT

Even with a successful history of the cloud transformation of 400+ JEE and .NET applications, and 1200+ cloud transformation readiness assessments for global Fortune 500 customers in various geographies with varied complexity across various verticals, it's imperative for us to prove that our solution will work for our new cloud customers for the applications portfolio in their private/public/hybrid cloud environment.

We do one pilot cloud transformation free of charge for a sample application (of mutually agreed complexity) from the client's applications portfolio. We call this as the "**Free POC Offer**".

STEP 4 – PORTFOLIO CLOUD TRANSFORMATION EXECUTION

Post the successful completion of the pilot, we group the applications in the portfolio into waves (based on the dependencies/technologies/complexities/migration risks, and other parameters) that are then cloud transformed using a factory model. Every wave starts with a detailed design document, followed by amaze® for Applications replatforming run, manual review/corrections/integrations by amaze® consultants, and rigorous quality gates before confirming the cloud transformation for the application ready for client SIT.

We provide complete support for any defects during SIT/UAT, post which we transition the cloud transformed application(s) to the client's application team(s) with complete code handover and training on all the changes that have been done, followed by a warranty support of 30 days (Hyper Care Support).

9. PROOF POINTS

1200+

Applications assessed for 40+ Fortune 500 global customers

400+

Applications cloud transformed for 20+ Fortune 500 global customers

800+

Applications in the pipeline for 30+ global customers

10. VALUE DELIVERED

50%

TCO reduction for applications in the portfolio

50%

Faster than manual

50%

Less costly





About Hexaware

Hexaware is the fastest growing next-generation provider of IT, BPO and consulting services. Our focus lies on taking a leadership position in helping our clients attain customer intimacy as their competitive advantage. Our digital offerings have helped our clients achieve operational excellence and customer delight by 'Powering Man Machine Collaboration.' We are now on a journey of metamorphosing the experiences of our customer's customers by leveraging our industry-leading delivery and execution model, built around the strategy— 'Automate Everything™, Cloudify Everything™ and Transform Customer Experiences™'.

We serve customers in Banking, Financial Services, Capital Markets, Healthcare, Insurance, Manufacturing, Retail, Education, Telecom, Professional Services (Tax, Audit, Accounting and Legal), Travel, Transportation and Logistics. We deliver highly evolved services in Rapid Application prototyping, development and deployment; Build, Migrate and Run cloud solutions; Automation-based Application support; Enterprise Solutions for digitizing the back-office; Customer Experience Transformation; Business Intelligence & Analytics; Digital Assurance (Testing); Infrastructure Management Services; and Business Process Services.

Hexaware services customers in over two dozen languages, from every major time zone and every major regulatory zone. Our goal is to be the first IT services company in the world to have a 50% digital workforce.

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Safe Harbor Statement

Certain statements in this press release concerning our future growth prospects are forward-looking statements, which involve a number of risks, and uncertainties that could cause actual results to differ materially from those in such forward-looking statements. The risks and uncertainties relating to these statements include, but are not limited to, risks and uncertainties regarding fluctuations in earnings, our ability to manage growth, intense competition in IT services including those factors which may affect our cost advantage, wage increases in India, our ability to attract and retain highly skilled professionals, time and cost overruns on fixed-price, fixed-time frame contracts, client concentration, restrictions on immigration, our ability to manage our international operations, reduced demand for technology in our key focus areas, disruptions in telecommunication networks, our ability to successfully complete and integrate potential acquisitions, liability for damages on our service contracts, the success of the companies in which Hexaware has made strategic investments, withdrawal of governmental fiscal incentives, political instability, legal restrictions on raising capital or acquiring companies outside India, and unauthorized use of our intellectual property and general economic conditions affecting our industry.

