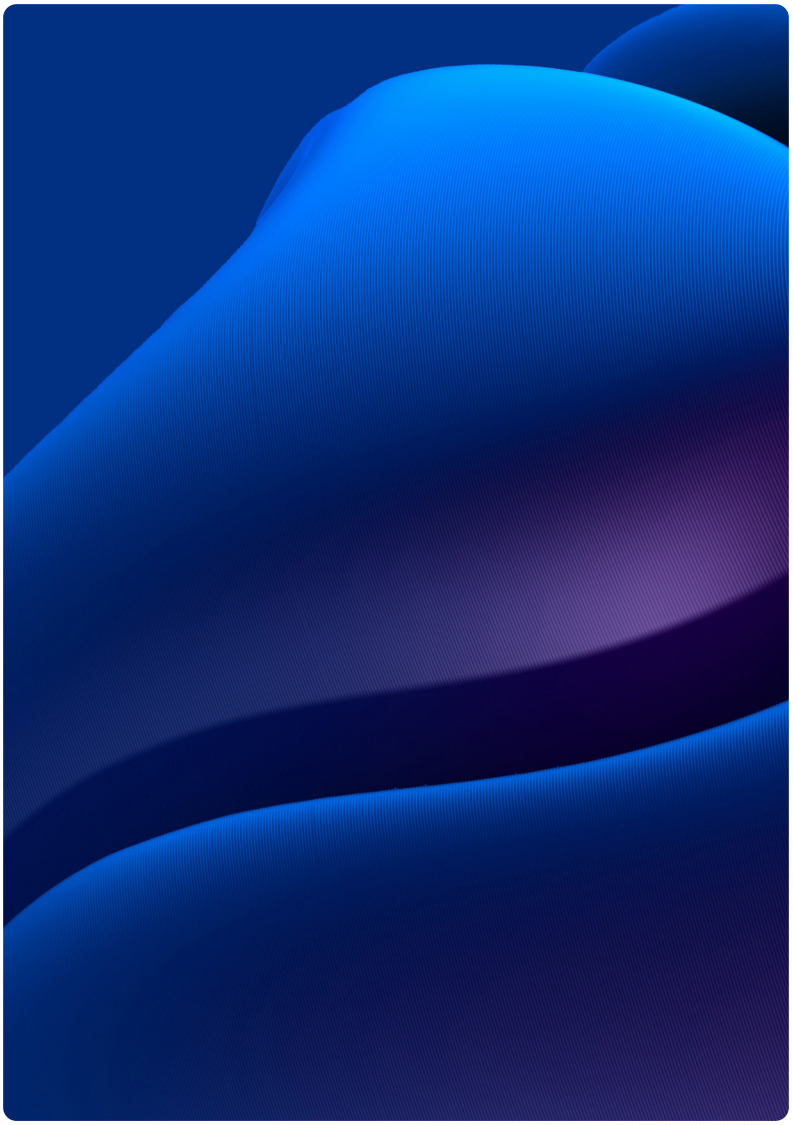
HCLTech | Supercharging Progress™

Mainframe modernization in the **hybrid** cloud world



That mainframes are an integral part of an enterprise is a no-brainer. Today mainframes manage almost 70% of the world's production IT workloads. Ninety-two of the world's top 100 banks, 18 of the 25 top retailers and 23 of the world's top 25 airlines rely on mainframes. The overall global mainframe market is expected to grow at a rate of 6-8% annually. Like large enterprises, even smaller organizations are moving their mainframe workloads, applications and databases to the cloud to make mainframe applications and the value they provide available as a workload whenever needed.

Mainframe and hybrid cloud

Mainframe and cloud are not either-or propositions. Mainframes must be leveraged and be part of any cloud strategy. A hybrid cloud strategy, for example, involves prioritizing each workload with an optimal platform— traditional, private cloud or public cloud—so that each workload is in the right place and each of the various environments is managing what it does best.

This helps to orchestrate multiple cloud properties with on-prem infrastructure, where, for example, an IBM Z Mainframe resides and runs mission-critical data and applications. It helps to create a unified environment optimized to get the best of both worlds - the agility and flexibility of the cloud, with the AI-driven insights, security, resiliency and scale of IBM Z. Multiple use cases where IBM Z can serve the hybrid cloud effort include but are not limited to:

Modernization and containerization of applications to increase developer velocity and provide consistent hybrid cloud management

Establishing low- latency integration between applications and business-critical data by co-locating cloud-native and traditional applications

Making cloud-native apps secure, scalable and resilient with co-optimized software and hardware infrastructure that deliver encryption everywhere and vertical scalability

With the right mainframe modernization approach and strategy, delivering innovative enterprise-wide agility and capability is possible. This helps secure operations, reduce latency and drive legacy processes to levels of dynamic innovation previously only possible for 'born in the cloud' insurgents. Additional benefits include infrastructure savings, workforce productivity, acceleration and enhanced business outcomes.

Customer challenges to mainframe modernization

While trying to align their investments and strategies for mainframe modernization using the cloud, most customers are concerned about the following:

Whether the transition will adversely affect business agility and efficiency.

Whether the digital transformation will lead to greater exposure of mainframe assets.

How to reduce costs (of licensing) and complexity while ensuring a seamless transition.

How to solve go-to-market challenges such as flexibility, speed to delivery and agility.

How to get the right people with the desired expertise while overcoming the shortage in skill sets available.

How to deal with an aging workforce that may not have the desired skills to align with the transition.

HCLTech's take on mainframe modernization

Our approach to mainframe modernization can help enterprises reduce operational costs and complexity while augmenting business productivity and agility. Our mainframe modernization leverages existing investments with targeted modernization vs. migration to the public cloud only. We focus on updating the apps so that they are maintained, extended, deployed and managed in a way that allows apps to meet current and future business needs.

We believe that customers must embrace a DevOps culture 'as is' analysis to build on the efficient functionality by either refining capabilities or adding new ones/modernizing incrementally to reduce time to value and business risks/leveraging mainframe for cloud-native workloads/integrating mainframe with hybrid cloud strategy.

The approach is to use the client's existing investments through mainframe application modernization while leveraging a hybrid cloud strategy spanning across mainframes and the cloud. This approach is centered on the business capability first view and incremental modernization. Enterprises can prioritize and reimagine their core and non-core business capabilities to realize their modernization objectives. It also enables a risk-free approach and minimal disruption to business operations while ensuring functional parity in a connected ecosystem.

HCLTech takes three approaches to mainframe modernization

In-place mainframe application modernization:

Mainframe for the cloud is our core modernization strategy with cloud-native development in IBM Z. Under this approach, we expose and refactor applications.

Modernize using co-location of traditional and cloud-native workloads:

Under this approach, we modernize in place on IBM Z by enabling cloud-native features. The legacy applications are optimized using the latest IBM Z processing features.

Utilize hybrid cloud architecture for modernization:

We drive hybrid cloud modernization across mainframe, on-premises and public cloud by modernizing applications and moving select workloads of the mainframe. This approach enables cross-platform system management and application orchestration.

HCLTech's mainframe modernization solution

Our industry-proven tools and frameworks accelerate the mainframe modernization journey by 40%. The solution helps to –

Identify and analyze technologies, platforms, business rules and components for modernization.

Seamlessly migrate and modernize using tools and frameworks created with decades of experience collaborating with clients.

Discover multiple technologies, HW to Middleware layers on mainframe and distributed platforms.

Capture application flow, data models and interdependencies.

Identify and manage areas of code complexity and risk.

Our solution offering includes the following:

iLIT-DC: A tool for taking stock of a given mainframe source inventory, finding the relationship and dependencies between components and assisting with the business rule extraction (BRE) process of a given suite of components.

Automated Technology Modernization Accelerator: Accelerates modernization of applications from various mainframe and midrange technology platforms, such as IBM COBOL, JCL, PL/1, Natural, RPG, etc., to modern stacks (Java or .NET with Angular UI) through automated transpilation.

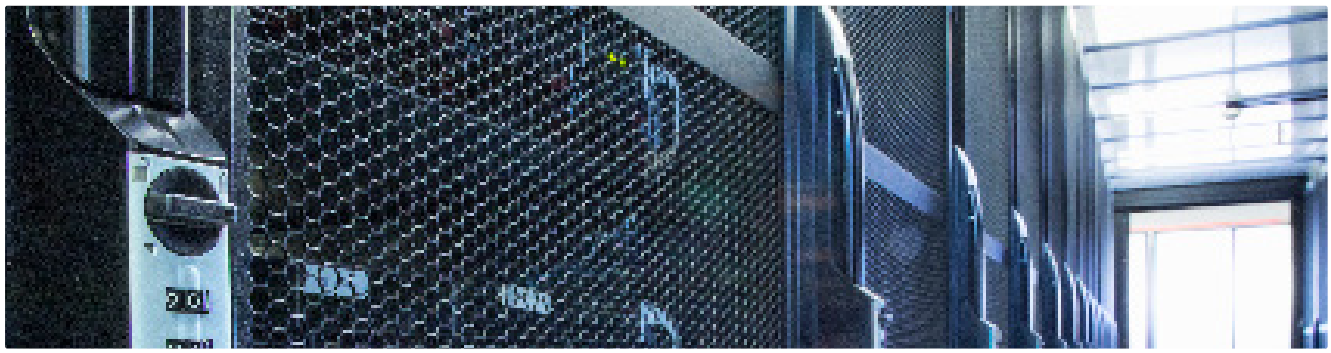
ADvantage Cloud: Accelerates modernization and migration of an application to cloud-native architecture and containers.

ADvantage Code: A low-code platform to help build cloud-native applications.

Sketch: Data modernization and migration from legacy to a modern cloud-native database

HCLTech tools and IPs for mainframe modernization acceleration

IP / Industry Tool			
Application Analysis	Prizm® (Portfolio assessment) iLIT-DC (Extract business rules and interdependencies) AD Specs (Generates program level specification)		Microfocus EA Caravel Insight G4 Analyzer / IBM ADDI /MF EA
Application, Database and Data Migration	iLIT suite (BRE Assist) ATMA (Cobol to Java / .Net Conversion, etc.)	ADvantage Migrate (for data migration) ZDT Tools (Data scrambling and import/export of mainframe data)	G4 Converter | MicroFocus ES Caravel Express (Modernization of NeoSuite and NetCOBOL (Microsoft application upgrade) HVR | Qlik (Aftunity)
Cloud Migration	ADvantage Cloud	ADvantage Code	Sketch
Testing	Digital QA (Intelligent Automation Framework –Regression and Microservices Testing)		
Platform Foundation	HDAP (DevSecOps pipeline management, IaC (Infra as Code) for platform setup and maintenance		Application 360 (for engagement and engineering metrics)

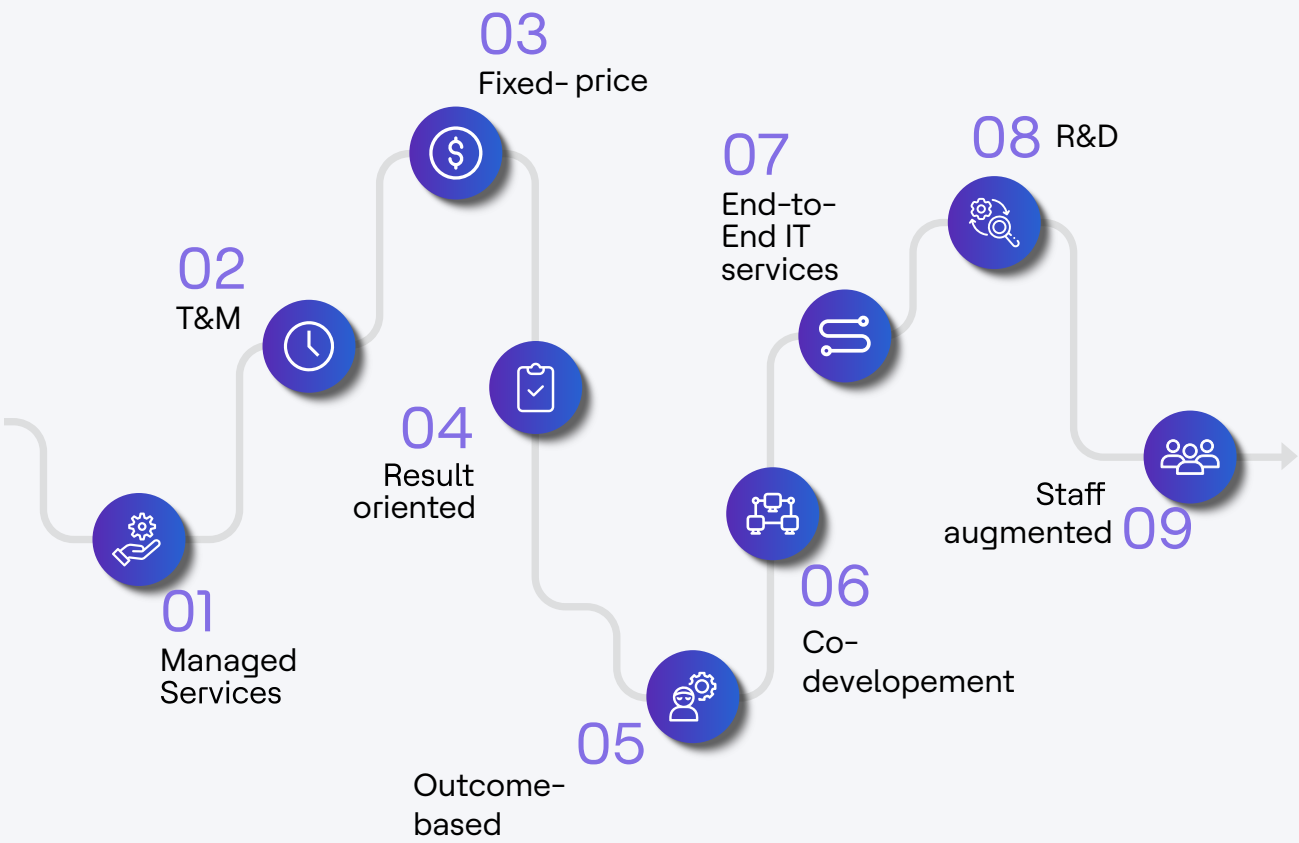


HCLTech in-house tools and framework for mainframe modernization

Transition	Optimization	Transformation
iLIT Inventory and discovery • Generates detailed applications report • Technical assessment tools, dependencies	zTune Optimization framework • Process, guidelines and templates for mainframe MIPS / performance / simplification process	ASM2COB Assembler > COBOL • Assists in converting ASM source, copybooks and Macros to COBOL
@IMT Impact analysis tool • Generates reports of impacted components based on a given seed	zSQL SQL optimization assistant • Generates detailed report of applications • Technical assessment tool, Dep	NAT2COB EZY2COB • Assists in converting Natural /Easytrieve Components to COBOLMacros to COBOL
AAT Architecture analyzer • Analyzes and reports the code architecture, complexity, standards, modularity, error handling, possible alternate usage	@TSTCOV Test coverage tool • Checks and reports the code test coverage achieved during testing	DBMIG IMS > DB2 FILESQL • Suite of tools to assist in converting DB /IMS to DB2 / file to RDBMS
DB Adv discover • Deep dive technical assessment of database / datastore components (IMS/ DB2/ VSAM) for ADSM / modernization	@SMFRPT SMF reporter • Reads and formats SMF data to generate meaningful information and identifies areas for tuning	iLIT DC BRE assist • Assists in identifying and scoping functions (main module / process) • Assists in rules extraction (BRE), func map, documentation
TranAssist process and functional scoping • Captures available functional details from source code and assist in scoping all programs / applications for transition • Assists in KT documentation	BatchTube job monitoring, reporting • Monitor jobs, alert, dependencies, critical path, etc. • Email and track critical items • Varied report generation	ReHost Suite MFTOPRO • Converts mainframe COBOL to Pro-COBOL • File, GDG, EBCDIC conversion tools • Comparison tools, • SAS integration tools

Service delivery model

HCLTech renders these services under multiple models to offer clients flexibility and convenience:



Additional outcomes that the offerings intend to deliver are:

- Reduce the talent gap by embracing standard tools and operating models
- Consistent DevOps and cloud-native development techniques for IBM Z
- Easily access mainframe data without moving off-platform
- Optimize costs with a hybrid cloud platform that extends to the mainframe
- Maintain the option of repatriating cloud applications for performance and infrastructure efficiency

Mainframe as a Service (MFaaS) offering

To align with pay-as-you-go approaches, service providers, including us, offer a mainframe as a service (MFaaS), which includes all hardware, software licensing and operations under a pay-per-MIPS arrangement. MFaaS is provided in a shared environment. Clients that need a pay-as-you-go model but prefer not to share resources may opt for managed mainframe operations, which enable custom combinations of hardware and licensing ownership.

Why HCLTech

HCLTech Managed Mainframe Services model is supported by:

World-class Tier III and equivalent enterprise-class facility

A highly leveraged, shared delivery platform that helps to aggregate client MIPS to garn

A no-keyhole approach means that the client retains the flexibility to choose the software to run business

A robust governance framework and clearly defined roadmap help to improve the process on the go making it lean and agile to meet changing needs of businesses. It also ensures enterprises benefit from a lower TCO and access better service quality and support.

With us, customers can expect the following outcomes from the modernization of their mainframe environment:

Modernized user experience

Microservice architecture

API layer for exposing services

Reduced TCO

Modernized data and applications

Quick time to market

Analyst recognition

- Leader in Everest Group PEAK Matrix for Mainframe Service Providers 2022
- Leader in Mainframe Operations in the ISG Provider Lens™ Mainframe Services and Solutions Report for the U.S, 2021
- Leader in Mainframe Transformation services, the ISG Provider Lens™ Mainframe Services and Solutions Report for the U.S, 2021

Get started on your mainframe modernization journey with HCLTech.

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