Mphasis
The Next Applied

Unisys – The Other Mainframe

POV by Roger Smith, Enterprise Architect Consultant

The availability of Unisys resources is limited and identifying the resources with exact experience related to the version of software and configuration of hardware is a daunting task. Resource availability is a common apprehension for those with Unisys and IBM mainframes in their enterprise.

The quintessential problems are **operational costs, antiquated programming techniques** and the **dwindling talent** for these specializations.

Mphasis is focused on cloud migrations from the perspective of IBM mainframes and other monolithic implementations including Java and .Net-based systems. These forms of migrations are dominant in the market and are the primary focus not only for Mphasis, but also for most of the market vendors, including those that focus primarily on mainframe migrations.

Since Unisys transformation is not typical, Mphasis proposes three approaches to migrating current applications to the cloud.

The first approach would be to work with our teaming partners to perform the migration. In this approach, there are two options:

1) Migrate via lift-n-shift to AWS using microfocus COBOL and comparable runtimes for C and Fortran-based applications. Further, subsequent efforts are required to migrate from these re-platformed applications to Java and microservices. This approach would utilize MCP for Burroughs-based applications or ClearPath OS 2200 for Sperry-based applications. Any applications that exist as Java implementations could be early candidates for direct migration.

2) Utilize the teaming partner IP to convert Unisys applications to Java and then utilize Java resources to migrate to microservices.

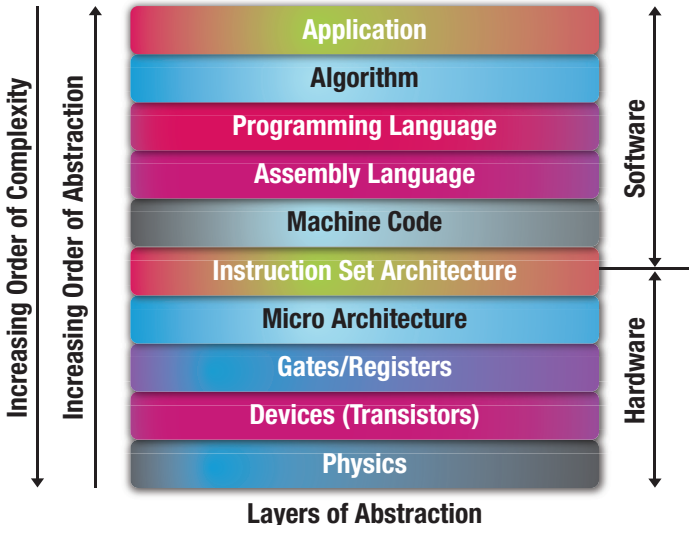
The second approach would be to contract resources to perform migration of Unisys applications directly to Java and microservices utilizing Mphasis' Unisys skilled personnel.

The third approach would be to apply Mphasis IP to parse the Unisys applications and create Java-based intermediate code with a microservice framework that will be refactored by Java resources to accommodate OS-specific I/O constructs by migrating to new constructs in the cloud environment. The parsers required for this approach would utilize grammar in the same way as older compilers and the Java JIT (Just-in-Time) compiler do with the exception that the result is not binary code (p-code for Java intermediate or machine code instruction for memo-ized performance-enhanced execution known as dynamic binary translation), but rather a text-based intermediate language. This technique also works for executable applications when the processor instruction set is identified.

The third approach is similar to the second option of the first approach, except that the intermediate language would contain microservice framework constructs as an additional accelerator.

For those of you who feel queasy when subjected to techno-jargon, you are advised to stop here. To fully articulate the methods that can be used to elevate an application to the cloud, we must first consider the application stack and the appropriate level of engagement.

Some of the complexity of migrating an application from Unisys is based on the processor and the CISC instruction set utilized by Unisys to speed up processing. Other implementations from other vendors use micro-code and CISC, a similar notion. As stated plainly, CISC-based processors use machine code instructions to execute multiple micro-instructions (Instruction Set), thereby reducing the instruction fetch cycle which accelerates the overall execution of the instruction. Why is this important for our migration is because these details will not be self-evident in the application code.

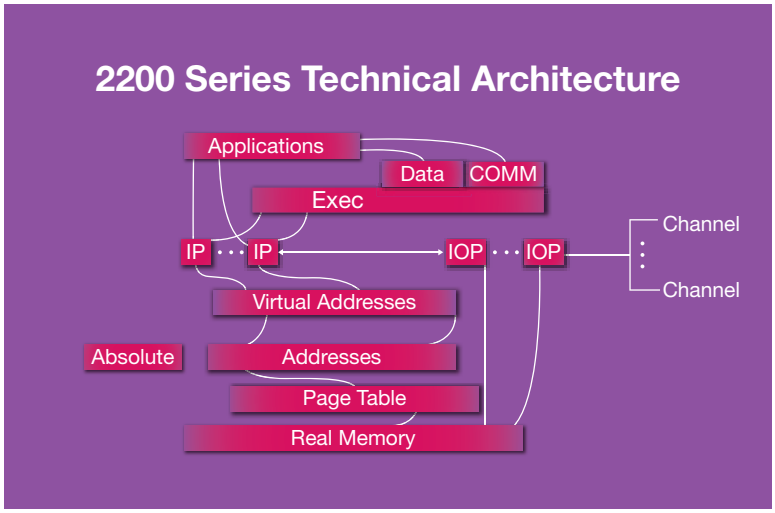


Additional consideration must be given to the form of input/output operations. On Unisys, some operations are performed via an IO processor, much like the channel processors on IBM MF, and others can be performed directly, specifically the network communications via TCP/IP and NICs.

Returning to the discussion on an appropriate level, we can see that we could implement conversion from the Programming Language level to the Instruction Set Architecture (via micro-code).

Many virtualization vendors use the machine code level to lift the application to the cloud. For example, the OS looks like an application that can be emulated or has been converted to use virtualization calls or libraries to function in the cloud/virtualized environment.

So, in the third approach, we are virtualizing the programming language or assembly language level and utilizing target architecture libraries instead of building a “secret sauce” libraries, as is the case with other vendors, which allows the application to be updated with new language libraries as needed.



The last topic presented here is the Unisys 2200 Operating System. Although the diagram to the right is trivial, there is nothing trivial about the Unisys OS; however, it does have similarities in design with other OSs. The thing to note here is that there are parallels between Unisys, IBM, Microsoft and Unix-based systems and maintain equivalent functionality. EXEC has minimal functional differences with Unix core or Windows 3 or Android kernel. All that is needed is to abstract the function and match that with a similar function in the target system.

Our teaming partner has been involved in over 50 mainframe conversion projects including some with Unisys Corporation where 10 of the projects involved modernizing various processes for financial institutions.

Mphasis has also been involved in delivering HPNS solutions for several clients modernizing COBOL and TAL components for deployment to distributed environments. These projects were greenfield and Mphasis involvement was 90% architecture, 100% design and 100% analysis.

More details available upon request.

Author

Roger Smith

Enterprise Architect Consultant

Roger is an Enterprise Architect for Mainframe Modernization at Mphasis. In this role, he is responsible for designing digital solutions that increase security, flexibility, reliability and resilience for on-prem, hybrid and cloud-based enterprise environments.

Roger has over 40 years of IT experience in multiple domains and across many different technologies. His focus has been on secure system design, security engineering (authentication, authorization, encryption, algorithm analysis), performance engineering, quality assurance, systems integration and system process improvement (DevOps, CI/CD/CM).

Roger's industry experience includes Financial (Banking, Investment, Audit), Retail, Utilities, Telecommunication, Decision Support, Identity Verification, Transportation (Airline Maintenance/Operations, Cargo, Rail), Oil and Gas and Defense Systems.

About Mphasis

Mphasis' purpose is to be the *"Driver in the Driverless Car"* for Global Enterprises by applying next-generation design, architecture and engineering services, to deliver scalable and sustainable software and technology solutions. Customer centricity is foundational to Mphasis, and is reflected in the Mphasis' Front2Back™ Transformation approach. Front2Back™ uses the exponential power of cloud and cognitive to provide hyper-personalized ($C = X2C^{2}_{TM} = 1$) digital experience to clients and their end customers. Mphasis' Service Transformation approach helps 'shrink the core' through the application of digital technologies across legacy environments within an enterprise, enabling businesses to stay ahead in a changing world. Mphasis' core reference architectures and tools, speed and innovation with domain expertise and specialization, combined with an integrated sustainability and purpose-led approach across its operations and solutions are key to building strong relationships with marquee clients. Click here to know more. (BSE: 526299; NSE: MPHASIS)

For more information, contact: marketinginfo.m@mphasis.com

USA
Mphasis Corporation
41 Madison Avenue
35th Floor, New York
New York 10010, USA
Tel: +1 (212) 686 6655

UK
Mphasis UK Limited
1 Ropemaker Street, London
EC2Y 9HT, United Kingdom
T : +44 020 7153 1327

INDIA
Mphasis Limited
Bagmane World Technology Center
Marathahalli Ring Road
Doddanakundhi Village, Mahadevapura
Bangalore 560 048, India
Tel.: +91 80 3352 5000

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