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2020

Mainframe modernization with APIs

How Deloitte and IBM solutions can help make it happen

Think fast

Facing even greater pressure than ever to adapt to a quickly changing environment, businesses are leaning heavily on IT organizations to ramp up their responsiveness. For IT leaders, that means delivering solutions more quickly than ever, without sacrificing quality or accuracy, and without exposing the organization to greater risk.

To say this is challenging for IT leaders is an understatement. Rewriting is slow and risky. So are migrating platforms and moving to the cloud—which can mean losing the benefits of the mainframe.

Together, Deloitte and IBM can help. By combining Deloitte's advanced toolsets and practical, hands-on business and IT experience with IBM's z/OS Connect EE, we're helping organizations across industries deploy existing assets in a hybrid environment, as well as deploying APIs internally to simplify existing applications. Just as important, our Deloitte Application Modernization innoWake™ Discovery solutions along with our broad industry subject matter expertise, can significantly increase adoption rates for these tools.

Read on to explore how it all can work together and help businesses and IT organizations modernize mainframe investments and become more responsive in the face of change.

The modernization imperative

Modernization at scale is needed to quickly seize new opportunities

Organizations are already working in entirely different ways than they were only a year ago, and this accelerated evolution shows no sign of slowing down. In order to enable this shift, IT leaders need to provide even more flexible, scalable, modern technologies.

In the midst of this transformation, mainframes still contain the most critical applications used by the organization and protect its most valuable data. The level of security, compliance and availability provided by mainframes remains unmatched.

While there are many misconceptions about the role of mainframes in light of other advances such as cloud computing, recent studies have shown that modernizing applications on the mainframe remains cost effective and relevant to business. There are ample opportunities to deploy modern innovations on a mainframe platform.

In short, mainframes are here to stay. That makes modernizing these platforms in a hybrid architecture even more important today. For many, integrating them into a hybrid architecture is the most effective approach.

Our recent survey of IT leaders revealed the continued relevance of mainframes as part of their IT strategies.

Here to stay

74% OF RESPONDENTS say they, **"believe the mainframe has long-term viability as a strategic platform for [their] organizations."**

Expanding footprints

91% OF RESPONDENTS identified **EXPANDING** their mainframe footprints as a moderate or critical priority in the next 12 months.

Mission critical

Survey results pointed to an expected increase in the amount of data and applications on the mainframe, as well as transaction volume over the next two years.

12% increase in mainframe applications

9% increase in data residing on the mainframe

Invigorating IT environments

72% OF RESPONDENTS are planning upgrades to their mainframes in the next three years. Why? To address expected increases in usage across three key areas.

SECURITY	STORAGE	SOFTWARE
69%	62%	61%

Talent gaps

MORE THAN HALF OF RESPONDENTS plan to use outside resources to accomplish their mainframe goals over the next three years.

Help needed

71% OF RESPONDENTS say their mainframe team is understaffed

93% say it's "moderately" to "extremely challenging" to acquire the right mainframe resources and skills.

Base: 261 business and IT decision makers with authority or influence over mainframe decisionsww
Source: A commissioned study conducted by Forrester Consulting on behalf of Deloitte Consulting LLP, June 2020

Putting the business in focus with APIs

Combine capabilities to modernize applications quickly and effectively

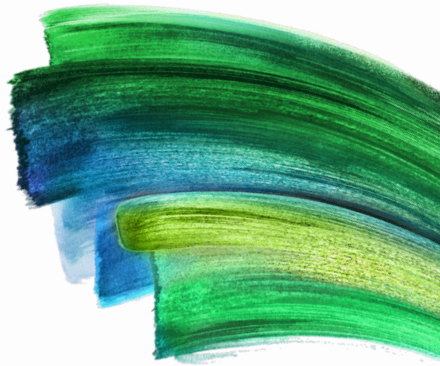
Introducing APIs to mainframe applications requires identifying the services that are exposed to external applications, as well as those consumed by mainframe applications.

Mainframe applications are often extensive, consisting of many lines of code and varying levels of complexity. At times, there may be limited knowledge of the application within the IT organization. Deloitte's innoWake Discovery and Mining solutions enable clients to automatically document and gain knowledge of their applications that may have been lost over time. Without this knowledge, deciding where and at what point to start modernization is extremely difficult.

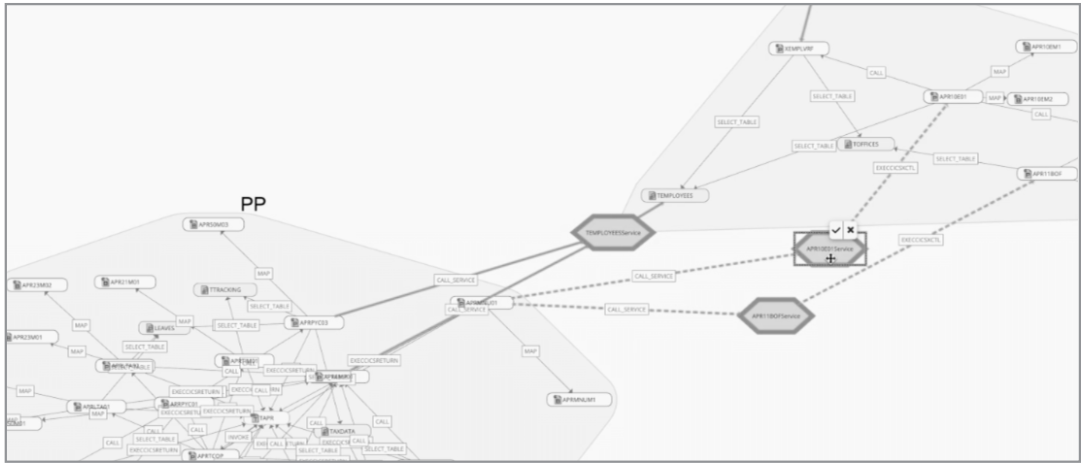
By "decomposing" applications with Deloitte's innoWake Discovery and Mining solutions, users can identify where valuable microservices can be enabled, and where to start in the most simple and effective manner. Combined with z/OS Connect, the tools enable users to define microservice points and group elements by business function, which provides elements that can then be exposed using APIs.

IT leaders can use Deloitte's capabilities and business value maps to identify which APIs will deliver the maximum benefit, and how they can best be used to drive business value. This is critical for modernization efforts to succeed.

Understanding these applications, ensuring they are well documented, and aligning them with business domains can all be accomplished with intuitive tools built for application analysis and to automate and expedite impact analysis processes.



Deloitte tools make sense of applications



Connecting services to APIs

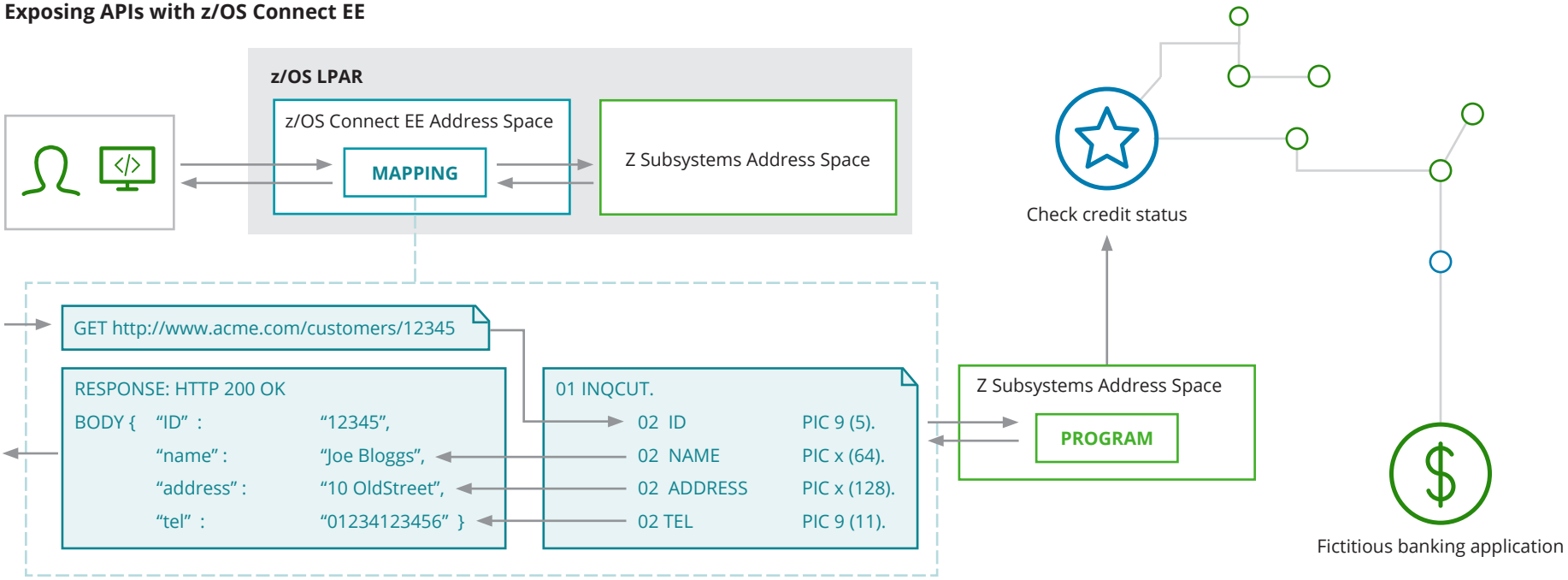
Combining Deloitte's solutions and IBM's z/OS Connect EE allows clients to deploy inbound and outbound services for consumption across cloud environments

Once a service entry point that delivers business value has been identified, the program can be defined within z/OS Connect EE with the mapping interface. This will map API requests to the data structures required by the service point, which is also identified with Deloitte's innoWake Discovery and Mining solutions.

Using the Swagger interface (included), these APIs can then be tested, before being made available through the API management solution. Rigorous version control allows for new versions to be developed and published in parallel.

Users also can drive the management of external API consumption by mainframe applications—managing external APIs in addition to internal APIs. Meanwhile, users have a single source of the truth (in the example below, for checking credit status), running on secure and trusted systems of record.

Exposing APIs with z/OS Connect EE



A connected approach

Deloitte is developing a connected approach to combine Discovery and Mining solutions with z/OS Connect EE

Deloitte's advanced approach to tooling increases efficiency and productivity, improves quality of analysis, and reduces the risk associated with manual analysis. How? By accelerating analysis, expediting the design and development of next generation APIs, and by using z/OS Connect EE in client environments.

Enabling mainframe-based APIs will help support clients' migration to a hybrid architecture and solve their modernization imperatives—all while maintaining their systems of record in the secure, compliant manner they require.

Inputs → **Tasks** → **Automated analysis** → **z/OS Connect EE API deployment**

Mainframe source code (JCL, COBOL, copybooks, stored procedures, etc.)

Available system/ process documentation

Mainframe technical SMEs, Deloitte technical and functional SMEs

Ingest source code and create repository

- **OBTAIN** legacy source code and feed to Application Modernization tools
- **IDENTIFY** any missing source code and request necessary files from client SMEs
- **CREATE** the repository

Expedite analysis with automated tooling

- **IDENTIFY** business function and processes for exposure with inventory reports dependency diagrams
- **REVIEW** data element usage and flow to aid in field mapping

View interfaces, screens, and trace data

- **VIEW** application flow, data interface requirements, and determine relevant process and data for API exposure

Taxonomies

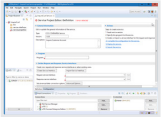
Dependencies

Data flow

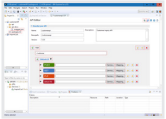
Data dictionary

Deep analysis provides key info

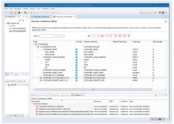
Analysis tools provide insight for process selection and data use. This can expedite identification and determination of service/API requirements and mapping data fields for exposure.



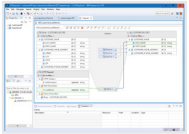
Service/API project



API editing



Copybook mapping



Selective data exposure

We intend to enhance this capability, conduct further market analysis, run a proof of concept, and enable automated processing between Discovery and Mining solutions, API consumer applications, and z/OS Connect EE.

We will also enhance our tools, delivering API consumer information that can be used with automated code generation utilities and case tools to quickly automate the consumption of APIs.

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