

OP Modernization: Technical Architecture Plans July 2020

As part of the current Analysis & Design phase, NYSED and NYSTEC are developing the plans for the technical architecture and technologies to be used to implement the modernization of the Unisys mainframe and myriad other existing systems, such as Content Manager and Access databases, as well as for paper processes at the Office of the Professions (OP). All architectural decisions are reviewed through proof-of-concept technical work as a first step where many have already been conducted as part of the Analysis & Design phase. The modern solution for OP involves development of an event-driven messaging system coupled with a number of relational databases to service custom-built Java applications and services, allowing communication of changes and updates among the independent application modules, thereby improving the ability to maintain and update the individual components through the loosely coupled design.

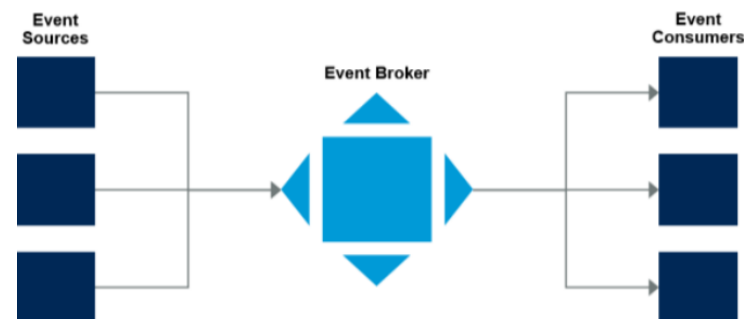
This modernized solution is called the New Professions System (NPS) and represents all external user interactions with OP regarding licensing and renewal as well as all internal OP staff interactions.

Migration Data from Mainframe to a Relational Database

The technical strategy focuses on data first. We are conducting a proof-of-concept with the Attachmate product, Databridge, to prove that we can migrate data to a data staging platform as an exact copy of the mainframe data. We will install a Data Change Capture tool to connect those data change events directly or indirectly to an event store to avoid the costly CPU interaction of near-real time or nightly batch processing of data extract files. The event store does not have to be asynchronous but our desire is that it is for near real-time data messaging.

The goal is that a data change capture tool is installed on the Unisys host to publish and synchronize data change events to an oracle database in near real time. If a tool like DataBridge is selected, that tool does have the option to stream events to Kafka, which appears to be a relatively recent feature. Our overall goal would be to limit our dependency on the DataBridge tool (thus perhaps not using 'enough' of its features to justify its cost). (A similar strategy through use of Databridge has been used by the NYS Insurance Fund.)

Use of a data change capture tool will allow for creation of an Event Broker to further modernize interaction among developed components while still using the Unisys mainframe for data and reporting during the full three-year migration.



Key Architectural Decisions

The primary goal for modernization is to first decouple /strangle data-read dependencies from the mainframe prior to moving forward with development of new online services (to be developed in Java). The process of decoupling/strangling/untangling/isolating the various read dependencies on the mainframe will significantly reduce risk to the new system when we go live.

OP Component	Solution Need	Brief Description	Technical Solution	Proof-of-Concept
Unisys Mainframe Data Migration	Periodic replication of data from DMSII/Mainframe/Unisys	Approach to extracting all the data from the legacy data store (DMSII).	Purchase and install DataBridge to populate ROSA data staging platform. This will allow us to pull chunks of mainframe functionality into the new platform in pieces.	NYSTEC has completed extract file-and-load back-up solution coupled with relational databases for Verification Search. Databridge software trial is underway.
Online Applications, Forms, and Renewals	Existing Java Web Applications Integration	Approach to how the existing applications and renewals systems continue to function without the mainframe existing.	Leverage Event Bus and Relational Databases to share information between these systems instead of sending data to the mainframe.	The online UI exists today for applications, some forms, and renewals; demonstrate interaction between NPS and event bus.
Component Communication	Event Messaging among Components	This is the backbone and “information highway” that allows the disparate components, or application modules, to communicate changes and updates occurring within the database.	Apache Kafka will be used for cross-component communication allowing functional components to be developed in isolation.	Demonstrate that components can share information with each other without direct access to their databases or REST APIs.
Document Repository	Microfocus Content Manager Integration	Documents for a licensee or a professional must be made available for rendering and view in other web applications.	Access documents in the Document Repository via the provided REST APIs and SDK.	Content Manager has been in use by OP since 2011, and demonstration of the API with NPS is part of implementation.

OP Component	Solution Need	Brief Description	Technical Solution	Proof-of-Concept
Third Party Data Import/Export for Education, Eligibility, Exams, and Experience (Pre-Licensure)	DOCS - Data Onboarding and Collection Service	Certify Third Party Data Exchanges - an on boarding process to allow exam providers and education programs to describe and provide data to OP for the automation of many of the collections required for an applicant to meet requirements for licensure that they can't provide themselves.	Custom Java Program developed in-house during implementation.	The NYSED TEACH System and IRS division have implemented data import/export services.
DPLS Staff Workflows	New Web Applications - non Drupal – to allow staff to manage pre-licensing and post-licensing needs for professionals, corporations, and education providers	These are all the various back office unit facing interfaces that must be built to allow the DPLS to conduct their business.	Cloud-hosted Java applications that are service-based and focused on performing small tasks well.	Demonstrate that OP services and applications interact with event bus and keeps components small and easy to maintain/understand.
Application for Licensure to 54 Professions Corporations, Pharmacy Establishments, and Education Providers	Pathway Interviews	This is the 'Q and A' of walking an applicant or professional thru their own set of options. This is inspired by opa.businessexpress.ny.gov - sometimes also called the "HR Block" tax questions interview.	Oracle OPA Tool, COTS cloud solution / SAML Integration between cloud and on premise/	The OPA Tool has been implemented to assist users applying to two professions to navigate the application pathway and find the requirements needed to apply for a professional license.
Email Messaging	Email communication to millions of professional users related to all licensing and renewal activities	Millions of email are sent monthly through MS Outlook from OP, including direct communication, reminder notices, and more.	Granicus will be used to manage communications with professional users. It will provide us with email analytics, list management, and ensure successful e-mail delivery.	OP made use of Granicus through DOH during the start of the COVID-19 pandemic to find the solution fits our needs.

OP Component	Solution Need	Brief Description	Technical Solution	Proof-of-Concept
Customer Management Solution	Interface - Oracle Service Cloud / Ticketing with Contact Us	Contact Us online support solution launched in 2019 will be integrated with the Oracle Ticketing system to improve visibility of customer service units and data usage metrics.	Contact Us Java online form coupled with Oracle Ticketing	Oracle ticketing integration with Contact Us solution is launching for one Customer Service Unit in June with expanded use rollout throughout the summer of 2020.
Support Call Center	Interface - Verizon Call Center	VCC provides single-point of entry for millions of customer service calls per year at OP.	VCC is fully implemented for phone support.	VCC solution implemented in summer of 2019, including a Chat pilot. Expansion of Chat services will continue to rollout through.
Office of Professional Discipline Misconduct Case Management	Case management tracking for investigators and legal services	Case Management System does not need to interface directly with NPS but should have the capability through API.	COTS Tool	NYSTEC deliverable will include recommendations and software trials will be used for POC.
Reporting and Data Analytics	Replicate current reports, such as Continuing Education Audits and All Professionals Licensed Monthly	More than 30 different mainframe programs are involved with processing data for reports for DPLS and Board Office use.	A combination of in-house reporting tools along with COTS solutions such as COGNOS, SAS, or Tableau.	In-house Reporting Services are currently implemented for K-12 and used in combination with SAS to provide reporting needs to the program area.
Credit Card Processing	Ability to process credit card payments	Payments for online applications and renewals must be available for all existing paper forms.	Authorize.Net	Solution Exists for Online Applications and Renewals.
Online Search for op.nysed.gov	Replace mainframe CGI program with modern verification search for professional licenses	Provide ability for public users to search NPS from the public-information site, op.nysed.gov.	REST APIs built on top of ROSA will be used to pull data into the Drupal platform and displayed to end-users.	Licensee-search from ROSA via REST APIs has been developed using test data.