NAIC

National Association *of* Insurance Commissioners

FISCAL IMPACT STATEMENT

DATE SUBMITTED:	MARCH 8, 2018
NAME OF INITIATIVE:	CLOUD TRANSITION PHASE II (CLOUD DEVELOPMENT TOOLS MODERNIZATION)
REGULATOR/BUSINESS SPONSOR:	INNOVATION AND TECHNOLOGY (EX) TASK FORCE
NAIC STAFF SUPPORT:	SCOTT MORRIS, CHIEF TECHNOLOGY OFFICER
REQUESTED INITIATIVE START DATE:	APRIL 16, 2018
ANTICIPATED COMPLETION DATE:	FEBRUARY 15, 2019
TOTAL REVENUE EXPECTED (2018):	$0
(2019):	$0
TOTAL EXPENSE REQUESTED (2018):	$1,747,946*
(2019):	$852,669*
TOTAL CAPITAL REQUESTED (2018):	$0
(2019):	$0

*Expenses are net of cost share with NIPR.

I.   Executive Summary:

The NAIC recently released *State Ahead*, a strategic blueprint approved by NAIC members to position the organization to better support the needs of state insurance regulators in a rapidly changing insurance marketplace. One significant element of that blueprint is the move of the organization's applications to the Cloud. Cloud solutions will enable the organization to streamline data intake processes; expand the tools offered to the membership and its constituents; reduce the cost of data processing and storage; increase the level and timeliness of analysis; and allow for experimentation of new products and services without a significant financial investment.

The groundwork for the transition to the Cloud began in mid-2017 with the membership's approval of a fiscal representing the Cloud Landing Zone. The NAIC's strategy for moving to the Cloud was validated by experienced consultants, and the environment was set up to support the initial applications chosen to move to the Cloud.

This fiscal outlines the second phase of the transition to the Cloud. This initiative includes completing the setup of the technical environments and cloud operating processes; licensing the best tools to securely develop and utilize the organization's data and applications; training

staff to use these tools; and preparing the organization for transformation to the Cloud. Ultimately, as applications move to the Cloud, the NAIC and NIPR will be able to more easily provide new features and functionality to benefit the membership, as well as consumers and the insurance industry.

A key component to the success of this initiative will be a culture shift at the organizational level. Thus this fiscal also includes a request for funding to support a DevOps transformation, which is the organizational capability impacting how new features move from a developer's fingertips to the customers in a highly automated, standardized, and secure way. DevOps blends organizational philosophies, processes, and tools to enable services to be delivered more quickly and efficiently.

There are numerous benefits to be gained from an investment in cloud technologies and the adoption of DevOps. These benefits include:

- *Increased system efficiencies*. Many existing manual processes will be automated, yet the amount of code used for computer programming will decrease. Both factors will improve the organization's ability to maintain its systems while increasing the functionality provided.

- *Improved system availability*. While NAIC systems generally provide a high level of availability, system performance and availability are expected to increase.

- *Enhanced customer support*. Each application will be managed separately in the Cloud, which will improve the ability to troubleshoot performance issues. In addition, several new tools will be used to identify, track, and address issues more easily or prevent issues from occurring in the first place.

- *Greater cost savings over time.* The pay-as-you-use model offered through the Cloud reduces the need for large capital and technology expenditures. As the organization's existing contracts expire, they will be replaced with less costly on-demand alternatives with predictable cost and flexibility to scale up or down as needed.

- *Increased capabilities and innovation through speed to market for new services.* The organization will have faster access to more cost-effective technology choices in areas like big data and artificial intelligence; the agility to explore new technologies; and be able to attract skilled talent pursuing work in modern platforms, tools, and templates.

This project also includes cloud technical support in the way of penetration testing for the following projects: Market Conduct Annual Statement (MCAS) Redesign; InsData Rewrite; Online Fraud Reporting System (OFRS) Redesign; and Consumer Information Source (CIS) Redesign.

II.   Key Deliverables:

The key deliverables used to measure the success of this initiative include:
- Implementation of tools, automated processes, and infrastructure for upcoming cloud projects.
- Staff training, development of migration methodologies, and the completion of several test migrations.

- Transformation and training in a DevOps culture of continuous learning and improvement with increased collaboration between internal development and operations teams.
- Improved automation of internal security and governance.

III.   Financial and Organizational Impact:

The financial impact of this project is summarized below within four main categories of expenses: computing, software, consulting, and training.

A. Computing

Computing cost of $284,750 is requested in 2018 to run cloud-based applications via Amazon Web Services (AWS) to cover the NAIC's non-project-specific costs and 2018 cloud projects. These run costs will continue and will be $385,250 in 2019. NIPR's run cost is $140,250 in 2018 and $189,750 in 2019.

B. Software/Tools

The NAIC expects to license several new Cloud and DevOps tools to bridge gaps in the current environment and improve organizational capabilities to transition to the Cloud. The NAIC license cost for these tools is $124,932 in 2018 and $265,253 in 2019; NIPR's cost is $61,533 in 2018 and $130,647 in 2019. Tools under consideration include:
- Log aggregation to consolidate disparate logs for improved analysis, searching, reporting and error handling;
- Platform and application monitoring to provide real-time metrics to detect and diagnose issues;
- Code repository to ensure version management and ease code reviews;
- Enhanced backups to improve recovery of applications and data;
- Incident management tracking system to accelerate response times and standardize processes and procedures;
- Messaging for team collaboration and transparency; and
- Web application firewall allowing for additional protection from malicious cyberattacks.

The NAIC's internal security team expects to license new tools as well as additional licenses for existing tools, in order to improve the security posture of the organization with this initiative. The NAIC's cost to license these tools is $83,080 in 2018 and $99,830 in 2019. NIPR's cost for these tools is $40,920 in 2018 and $49,170 in 2019. The tools include the following:
- Cloud compliance tool to secure cloud services and minimize the ability for unauthorized users to gain entry to applications;
- Additional license allocations for the current Security Information and Event Management (SIEM) software for greater real-time analysis of security alerts;
- Web application scanning to identify potential security vulnerabilities within applications;
- Additional license allocations for the current vulnerability scanner, which identifies weaknesses across computers, networks, and equipment; and
- Usage costs to research security-related tools as they become available in the Cloud.

C. Consulting

This fiscal requests consulting expertise, with a portion of the engagements to be cost-shared with NIPR. The NAIC's portion of these requests totals $1,104,674 in 2018 and $69,161 in 2019. NIPR's share of the consulting engagements is $273,900 in 2018 and $13,200 in 2019. In addition, a portion of the NAIC's staff augmentation consulting will be offset by $208,488 in

2018 and $18,077 in 2019 in credits for the NAIC staff work charged to NIPR under the NAIC/NIPR Licenses and Services Agreement. The consulting requests include:

- Staff augmentation consultants (NAIC-$488,574 in 2018 and $42,361 in 2019), to enable six NAIC technical staff to transition their operational work in order to be fully dedicated to this initiative. The skillsets required of these consultants range from solution architect to database administrator.
- Cloud and DevOps Tool specialists (NAIC-$475,700 and NIPR-$234,300 in 2018; NAIC-$26,800 and NIPR-$13,200 in 2019), with technical expertise in the new tools being implemented, pre-migration activities, and cloud shared services build out and configuration. This includes:
  o Workshops with technical subject matter experts
  o Shared services build out consulting
  o Identify management and cost optimization
- Security Program Assessment (NAIC-$80,400 and NIPR-$39,600 in 2018) to ensure compliance rules and security policies are met.
- Penetration testing (NAIC-$60,000 in 2018) to ensure the four 2018 cloud projects are not vulnerable to security threats.

D. Training
It will be necessary to train NAIC technical and security staff to use the new tools and to adopt a DevOps culture. The fiscal includes $150,510 in 2018 and $33,175 in 2019 to fund the following requests:

- Security team training
- Cloud and DevOps training for technical staff
- Training certifications

See **Attachment I** for further financial details.

Business Area Impacts
There will be significant operational impacts as a result of transitioning to the Cloud and adopting DevOps practices. New processes to manage and use cloud resources and to deploy and configure code will be established.

- *Finance/Budgeting* – the move to cloud computing will require changes in expense management, moving from capital asset expenditures and maintenance to consumption-based pricing and operating expenses. Business areas and Finance will have the ability to readily see the cost to run production workloads in the Cloud, which is not available in the current technology structure.
- *Human Resources and People Managers* – new skills and roles will be required, staff will need to be trained, and organizational changes may be required to support new processes.
- *Organizational Change Management* – there will need to be a strong change management process in place to ensure a successful cloud program and successful transition of staff to new processes.
- *IT Governance* – policies will need to be established for the use of cloud computing.
- *IT Security* – security will be redesigned or modified to meet compliance rules and protect data, applications, and infrastructure for cloud computing.
- *IT Development and Operations* – new processes will be defined to manage and deliver cloud services and infrastructure. There will be a blurring of roles between developers, testers, and operators as a DevOps culture is adopted.

IV. Stakeholder Impact if the Fiscal is Not Approved:

If this project is not approved, the cloud adoption and execution for NAIC and NIPR will be disparate, inefficient, and less secure. The benefits described in the Executive Summary will be minimized or in some cases unrealized.

The move to the Cloud represents a major shift in the way the organization provides products and services for its members. As the major stakeholder, every effort will be made to maximize benefits to the membership while minimizing negative impacts that might occur as a result of undertaking a project of this size.

Initially, NAIC and NIPR staff will be the most impacted stakeholders as there will be changes to a large number of internal business areas. Overall, the stakeholders include:
- NAIC and NIPR Business Units (legal, finance, human resources and business application owners) – internal staff who will use technology hosted on the Cloud.
- NAIC and NIPR Technical Staff (architects, developers, testers, security, network, infrastructure, project managers, application owners, operations, and process owners) – will provide technical expertise to implement technology on the Cloud.
- Regulators & Industry – users of technology implemented on the Cloud.

External and internal web users of applications that migrate to the Cloud are stakeholders, too. While they will probably experience the least change in terms of modifications to their work processes or loss of productivity during product migrations, they are expected to see many benefits from the advantages of cloud computing with greater system reliability and faster resolution of system issues should they occur.

V. Risk Management Plan if the Fiscal is Approved:

The Cloud is a new computing technology for the NAIC and NIPR and there is a high rate of change in cloud services and offerings. This risk is being minimized by the assignment of a NAIC staff member, the Chief Architect with cloud experience, and by leveraging the technical expertise of highly rated cloud vendors and partners as needed. Although this is a new technology for the NAIC, this service has been in existence since 2006 and a large number of companies are currently using similar technology.

Inherent with technology adoption are a number of other risks, as outlined below:
- The internal capacity of staff is a risk and is being mitigated by leveraging staff augmentation for key roles to enable them to work on this initiative.
- The transition to working in the Cloud and within a DevOps culture is transformational and some staff may not understand the new culture. The risk is being minimized through a comprehensive change management plan, which includes communication, training, and provisioning of managers with tools and information to assist with the transition.
- New skills will be needed for the transition to the Cloud and a DevOps culture. This risk is being minimized by a training plan that has learning paths by role that includes cloud, DevOps, and agile domains. Training will be provided to employees through a variety of mediums including online, instructor-led, self-study, and hands-on training.
- Cloud operating costs are ongoing and typically non-negotiable. Existing resources cannot be stretched beyond original planned obsolescence without a cost (e.g., servers being used beyond their depreciable life cycle from three years to four or five years).

Legal counsel and external expertise will be very important in establishing the contracts and agreements for cloud services.

- New tools are needed for automation and scalability for cloud migrations. The initial selection of tools may need to be adjusted based on learnings as the project progresses. This risk is being managed by conducting proof of concepts using trial subscriptions before buying a small number of tool subscriptions to start out with before scaling to enterprise-wide needs.
- The NAIC's internal Enterprise Project Management Office has initiated cloud program management to manage risks and dependencies across the various cloud projects, change management, training, and communication.

External business partners and vendors may also experience change as a result of this initiative if there are changes to the web services or other specifications upon which they rely when an application they use is migrated to the Cloud. For example, some external partners use a web service to retrieve or submit data from or to the NAIC. If the web service changes, the partner will need to incorporate that change. Communication and coordination will be important to provide these business partners and vendors advanced notification of any impacts to them, as well as the time needed to respond to the changes.

VI.   Security Impact:

This second phase of the project builds on the secure and reliable cloud computing foundation established in the first phase (Cloud Landing Zone and Roadmap), approved by the Executive Committee membership in July 2017. Specifically, this project:

- Improves and increases the security and governance automation for the Cloud.
- Automates security and governance in the new DevOps processes for software life cycle development.
- Verifies compliance rules and security policies are met by leveraging an external experienced consultant to conduct a cloud security assessment.
- Confirms 2018 cloud projects have a high level of protection from cybersecurity threats by leveraging an external consultant to conduct penetration tests on applications before they go to production.
- Implements several security-related tools to support the internal security team as they monitor compliance and security for the Cloud.

Ultimately, the NAIC believes the move to a cloud environment will provide greater security than the current environment, but will need to manage multiple environments from a security standpoint while this transition is occurring.

2018 Budget
Fiscal Impact Statement Project Cost Analysis

Project/Initiative: Cloud Development Tools Modernization

Business Entity: NAIC

Description	April	May	June	July	August	September	October	November	December	2018 Total	2019 Budget
Revenues:											
Total Revenues	-	-	-	-	-	-	-	-	-	-	-
Expenses:											
A. Computing											
Computing Costs via AWS	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,200	47,400	425,000	575,000
NIPR Credit for Computing Costs via AWS	(15,576)	(15,576)	(15,576)	(15,576)	(15,576)	(15,576)	(15,576)	(15,576)	(15,642)	(140,250)	(189,750)
NAIC Net Cost for Computing	31,624	31,624	31,624	31,624	31,624	31,624	31,624	31,624	31,758	284,750	385,250
B. Software/Tools											
Cloud & DevOps Tool Licenses	16,277	16,277	16,277	16,277	17,945	21,999	22,152	27,652	31,609	186,465	395,900
NIPR Credit for Cloud & DevOps Tool Licenses	(5,371)	(5,371)	(5,371)	(5,371)	(5,922)	(7,260)	(7,310)	(9,125)	(10,431)	(61,533)	(130,647)
NAIC Net Cost for Cloud & DevOps Software/Tools	10,906	10,906	10,906	10,906	12,023	14,739	14,842	18,527	21,178	124,932	265,253
Security Team Tool Licenses	13,778	13,778	13,778	13,778	13,778	13,778	13,778	13,778	13,776	124,000	149,000
NIPR Credit for Security Team Tool Licenses	(4,547)	(4,547)	(4,547)	(4,547)	(4,547)	(4,547)	(4,547)	(4,547)	(4,546)	(40,920)	(49,170)
NAIC Net Cost for Security Team Software/Tools	9,231	9,231	9,231	9,231	9,231	9,231	9,231	9,231	9,230	83,080	99,830
C. Consulting											
Staff Augmentation Consulting	24,176	80,585	84,614	84,614	92,673	76,556	92,673	80,585	80,586	697,062	60,438
NIPR Credit for NAIC staff resources on Cloud project	(7,231)	(24,103)	(25,308)	(25,308)	(27,718)	(22,897)	(27,718)	(24,103)	(24,103)	(208,488)	(18,077)
NAIC Net Cost for Staff Augmentation	16,945	56,482	59,306	59,306	64,955	53,659	64,955	56,482	56,483	488,574	42,361
Cloud & DevOps Tools Consulting	-	40,000	80,000	95,000	105,000	125,000	105,000	85,000	75,000	710,000	40,000
NIPR Credit for Cloud & DevOps Tools Consulting	-	(13,200)	(26,400)	(31,350)	(34,650)	(41,250)	(34,650)	(28,050)	(24,750)	(234,300)	(13,200)
NAIC Net Cost for Staff Augmentation	-	26,800	53,600	63,650	70,350	83,750	70,350	56,950	50,250	475,700	26,800
Security Program Assessment Consulting			120,000							120,000	
NIPR Credit for Security Program Assessment Consulting			(39,600)							(39,600)	
NAIC Net Cost for Security Program Assessment	-	-	80,400	-	-	-	-	-	-	80,400	-
NAIC Cost for Penetration Testing Services	15,000			15,000		15,000		15,000		60,000	
D. Training											
Security Team Training				2,000						2,000	
Cloud Training-Security Team	990	248	248	248	248	248	248	248	248	2,970	2,970
Cloud Training-IT Staff	9,847	2,462	2,462	2,462	2,462	2,462	3,462	2,462	2,462	30,540	30,205
DevOps Training-IT Staff			40,000			50,000			10,000	100,000	
Training Certification	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,400	15,000	
NAIC Cost for Training	12,537	4,409	44,409	6,409	4,409	54,409	5,409	4,409	14,109	150,510	33,175
Total Expenses	**96,243**	**139,452**	**289,476**	**196,126**	**192,593**	**262,412**	**196,411**	**192,224**	**183,009**	**1,747,946**	**852,669**
Revenues Over (Under) Expenses	**(96,243)**	**(139,452)**	**(289,476)**	**(196,126)**	**(192,593)**	**(262,412)**	**(196,411)**	**(192,224)**	**(183,009)**	**(1,747,946)**	**(852,669)**

Total 2018/2019   **2,600,615**