State of North Carolina, Department of Health and Human Services

NC FAST Application and Infrastructure Modernization (AIM)

August 02, 2024

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AIM Vision & Goals

VISION

NC FAST's Application and Infrastructure Modernization (AIM) project seeks to transform and modernize NC FAST applications and infrastructure through cloud migration and the implementation of new tools, technologies, and automation to respond to business and citizens' needs faster by reducing operational costs and increasing innovation.

GOALS

The AIM project will be conducted in three phases, Migration and Modernization, to reduce risk and improve system stability, flexibility, and availability.

Phase 1: Migration
Built the AIM Cloud for modernizing all DHHS applications. Migrated the first two applications - EB and CWS
Leverage Cloud capabilities to improve system performance and deliver more predictable cost.

Phase 2: Roadmap & Optimization
Develop a comprehensive roadmap to modernize with focus on user-centric technology solutions. Prioritize availability, ease of development, and maintenance. Optimize cost and operational efficiency.

Phase 3: Application Modernization
Execute the roadmap to replace and modernize the NC FAST applications on a Cloud-native stack.

BENEFITS

- **Foundation for Enhanced User Experience**
- **Improved System Performance**
- **Predictable Cost of Delivery**
- **Improve User Experience**
- **Optimize Infrastructure**
- **Operational Excellence**
- **Revamped User Interface & Experience**
- **Modular Services Framework**
- **Streamlined Enterprise Services**

Migration Technical Guiding Principles

Guiding principles for NC FAST to follow during migration to Cloud

Automate Configurations: Automate configurations (e.g., scripting) from lower environments where possible to drive efficiency through NC FAST operations. Use environment blueprints where possible to expedite build times.

Leverage Cloud Native: Use Cloud Native solutions where possible to leverage market-leading technologies and continue to drive innovation throughout NC FAST.

Future-Proof Migration: Incorporate best practices from DevOps by standardizing the environment lifecycle and leveraging the Shared Services Design for scalability and modernization. Creating a platform that will enable DevOps best practices.

Implement Migration Accelerators: Where possible, incorporate the use of tools that will facilitate migration activities (e.g., ATAVision for Discovery, automation for deployments).

Prioritize Complexity: Begin migrating more complex applications first to allow more time to build, test, and resolve any unforeseen issues.

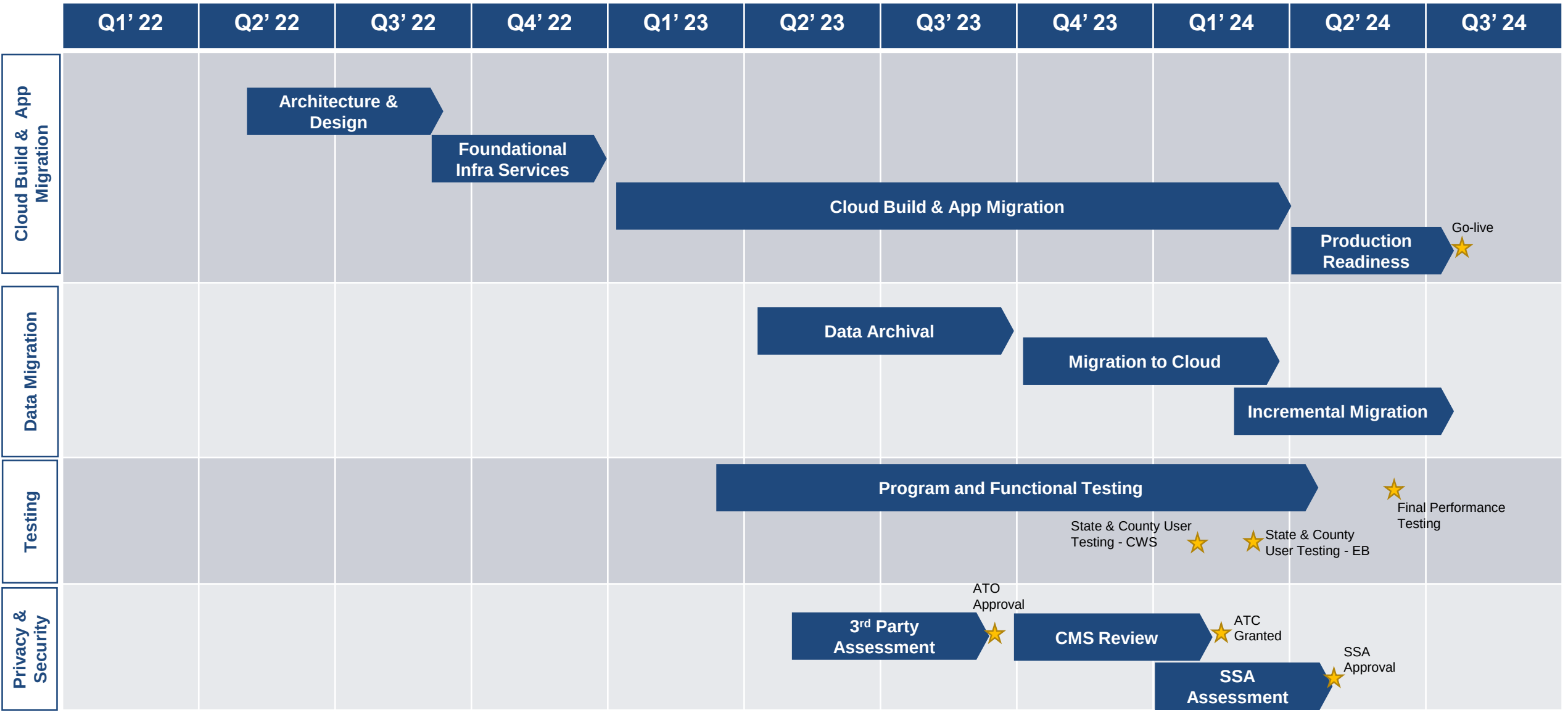
Put Security First: Incorporate security-first practices within identity and access management to ensure compliance requirements are met and enable innovation.

Set Deployment Governance: Incorporate deployment best practices to the governance framework to facilitate team collaboration, migration delivery, and proper knowledge transfer channels before Go-Live.

Establish Uniform Operations: Establish operations standards across migration teams to minimize administrative roadblocks and ensure consistent, high-quality work throughout migration.

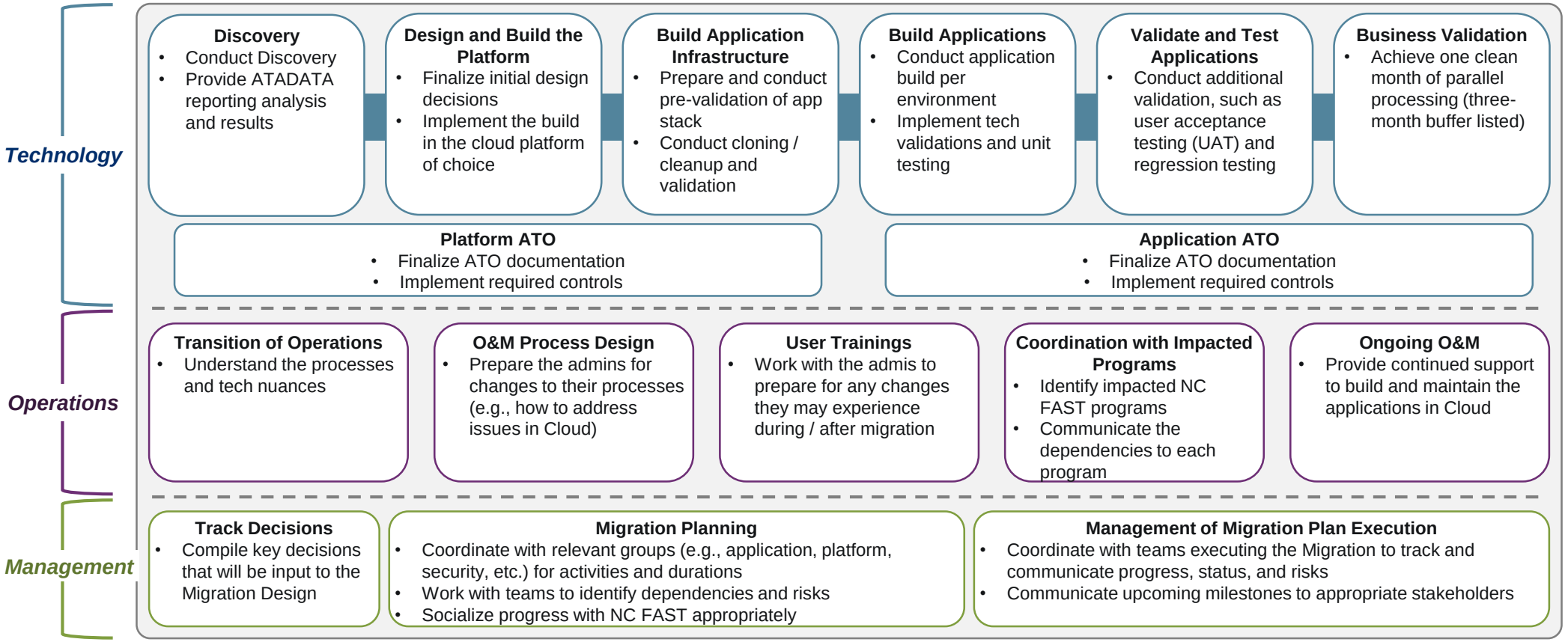
Note: These technically-focused guiding principles complement the Could Business Principles found in the NC FAST Business Case.

AIM Phase 1 Roadmap



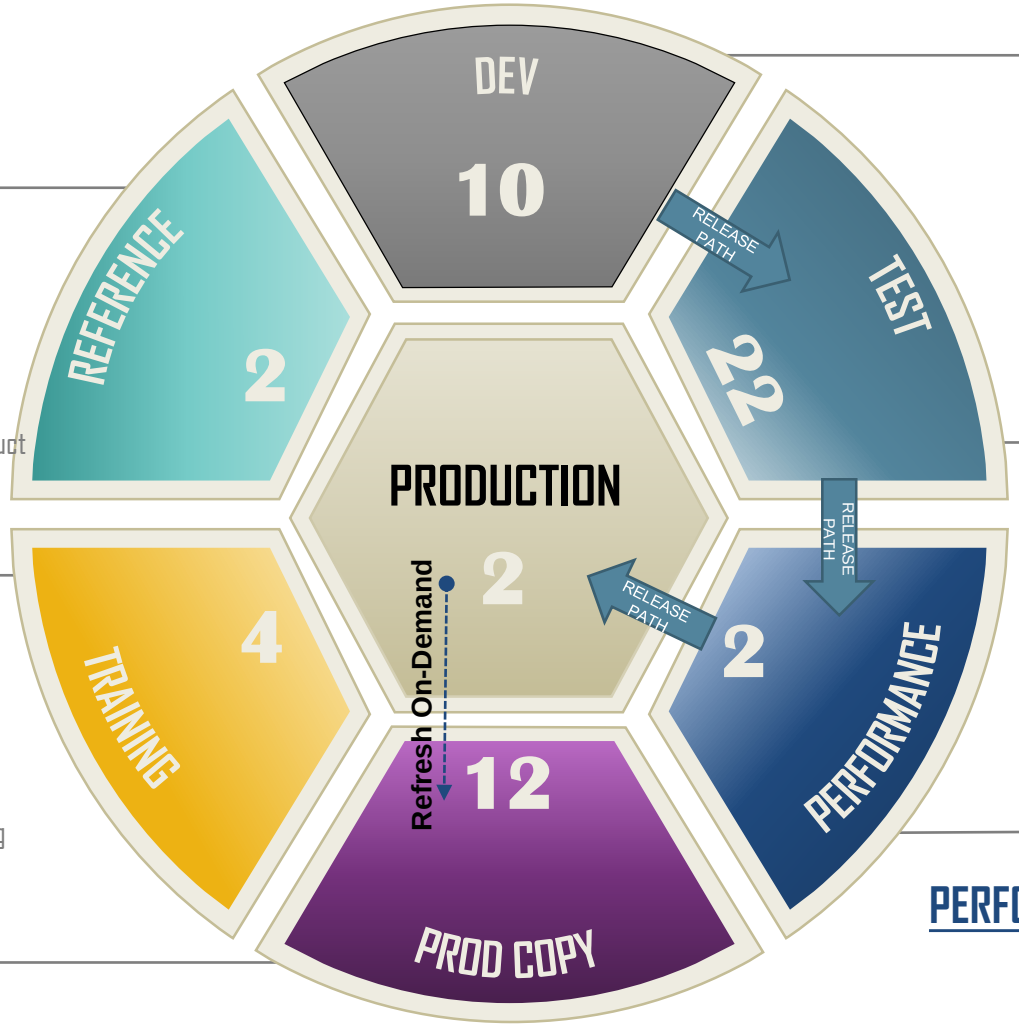
Phase 1 Steps to Go-Live

The NC FAST migration approach involves understanding all the components involved from a technology, operations, and management perspective. The remaining activities and building blocks required to get from today to Go-Live are below.



Note: This view is not tied to a timeline and is intended to highlight the sequential steps to consider for migration.

Environments breakdown



DEV

Use Cases:

- Program and Functional Tests By Agile Teams
- Shift Left Automation Smoke Tests for a given release.
- Patch/Hotfix Tests

TEST

Use Cases:

- Regression Tests performed by Regression Test Team for a given release.

PERFORMANCE

Use Cases:

- System Performance Tests
- System Load Test
- System Stress Tests.

REFERENCE

Use Cases:

- Validate Out of the Box Behavior
- Reference points for Product Owners and Developers.

Training

Use Cases:

- County User Testing and Training.
- Community College Training

PROD COPY

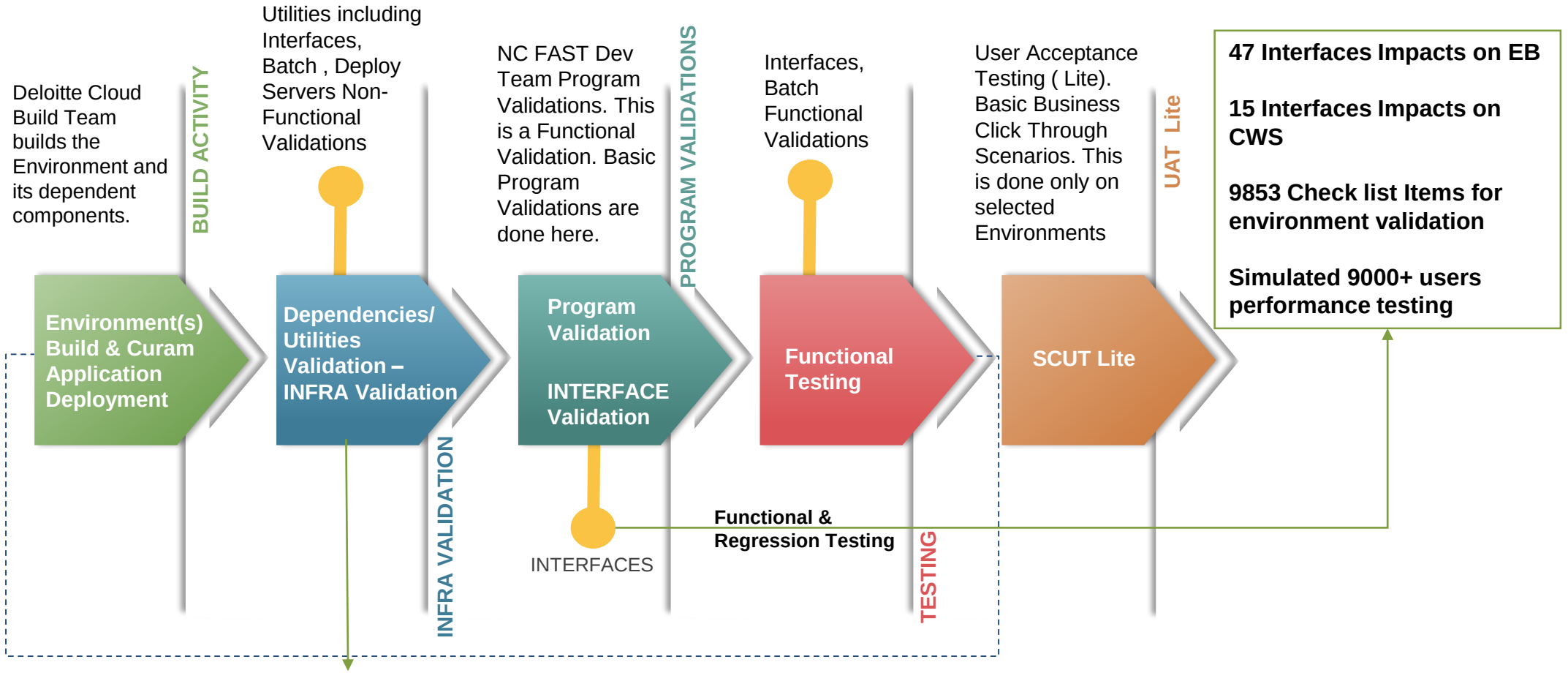
Use Cases:

- Help Desk Support
- Production Defects Investigation
- Functionality Validation and testing

TOTAL ENVIRONMENTS = 52 + 2 PROD

- Food and Nutrition Services (FNS)
- Medicaid
- Subsidized Childcare
- Cash Assistance
- Refugee Assistance
- Special assistance
- Energy Assistance
- Enterprise program Integrity(EPI)
- Child Welfare Information System (CWIS)

Acceptance Validation and Testing Activities



AIM Phase 1 Accomplishments & Benefits

Built scalable & resilient infrastructure in AWS cloud

Re-platformed from AIX to Linux

Migrated 56 environments and 40 utilities that support 7 Economic Benefits programs and 1 CWIS program

Migrated over 500 TB of data to cloud

Stress-tested the environments with 9,000+ simulated users

Foundation for Enhanced User Experience

- Automation for deployments that enables faster releases
- Reducing environment build time from weeks to hours
- Quickly scale up during peak demand hours
- Built in redundancy delivers high availability

Improved System Performance

- Faster response times during peak hours
- Reduced unplanned outages
- Real time monitoring and provisioning provides quick resolution of performance issues

Predictable Cost of Delivery

- Pay for services only when needed
- Cost based on usage
- Governance for cost transparency

Food and Nutrition Services | Medicaid | Subsidized Childcare | Cash Assistance | Refugee Assistance | Special assistance | Energy Assistance | Enterprise program Integrity | Child Welfare Information System

AIM Phase 2 Plan

Develop a roadmap to modernize EB applications and data

Focus on user experience

Enhance system availability and reliability for caseworkers

Reduce and streamline infrastructure expenses

Boost operational efficiency and productivity

Establish a strategic plan for application modernization

Enhanced User Experience

- Optimize application load times and processing speeds by leveraging cloud computing resources.

Optimize Infrastructure

- Leverage scalable cloud services to adjust resources based on demand, avoiding overprovisioning
- Modernize smaller programs through cloud native technologies

Operational Excellence

- Automate routine tasks and workflows to reduce manual intervention and human error.
- Integrate cloud analytics tools to gain insights into operations and identify areas for improvement.

Food and Nutrition Services | Medicaid | Subsidized Childcare | Cash Assistance | Refugee Assistance | Special assistance | Energy Assistance | Enterprise program Integrity | Child Welfare Information System

NC FAST Modernization Journey

The high-level estimated timeline below illustrates the AIM Strategic Goals over the next few years subject to Short Session and Biennium funding.

Apr 2022
Cloud Provider Selection

Oct 2022
Design Proposed Cloud Architecture

Dec 2023
Develop, Build & Test Cloud Services

Jul 2024
★ CWS & EB Applications Go-Live on Cloud

Phase 2

2024-2025

Planning and Roadmap for Application Modernization

Develop a comprehensive roadmap to replace or otherwise modernize NC FAST-based technology with modern, user experience focused, availability, and easy-to-develop and maintain solutions

2025-2026

Achieve Cloud Native Efficiency and Cost optimization

IT Optimization, Cloud Operational Dashboard, Enhance Economic Benefits (EB)System availability by foundational model for extended period

Phase 3

2026-2029

Application Modernization

Design and implement modularization of the current platform into smaller programs.

Replace existing applications and other inefficient legacy platform with better caseworker experience, and easy to enhance/operate

AIM Phase 1

AIM Phase 2

AIM Phase 3

AIM Team - Key Players (Over 100+ contributors)

ITD-NCFAST Team: David Schatten, Kaushal Bansal, Rajesh Pandey, Vijay Ramachandran, Prashanth Prakash, Pandiarajan Ramasamy, Sreenadha Vaka, and their teams

Deloitte: David Savino, Ashish Varan, John Lee, Sam Gibbs, and their teams

Business Divisions: Susan Osborne, Melanie Bush, Sarah Gregosky, Madhu Vulimiri, Carla West and their teams

DIT: Mick DiGrazia, Brian Dickerson, Glenn Poplawski, Srinivas Sunkara, Jon Nedell, and their teams

AWS: Dan Graves, Andrew Norris and their teams

Rest of ITD: Mathew Boose, Shawn Holland, Pyreddy Reddy, Richard Meduri

Operational Excellence Leaders: Vijay Ramanujam, Steve Tedder (retired), and Reese Edgington

Post AIM Go Live Feedback

File uploads **100+failure errors/day reduced to zero errors.**

Memory Utilization **reduced from 50%-80% to 20%**

Performance Issues/Timeouts in some large volume functionalities like Person Duplicates and Case Logs eliminated and executed **in 3 seconds**

"**Attaching documents is running smoother"** – Teresa Oakley (Person county)

"The system is up and running and hasn't been slow as far as anyone can tell but that's about it." – Shacona Washington (Johnston county)

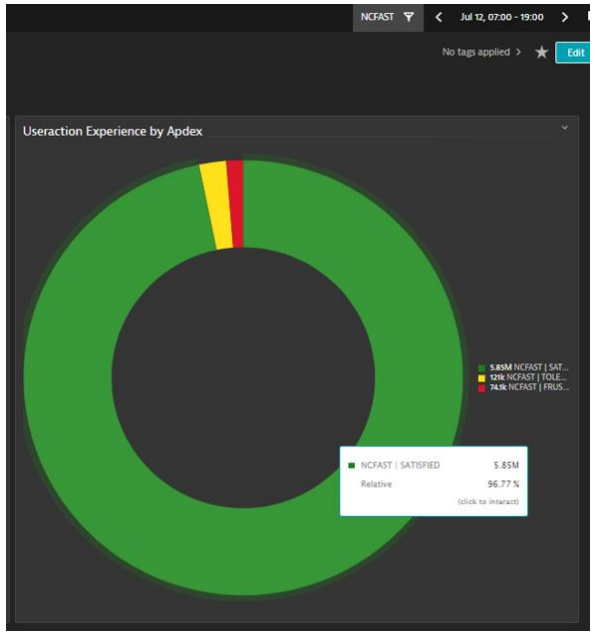
"**Overall, I would say the system is working quicker. The registered person is loading quicker and not adding time for loading which previously were very slow to load and added to work time**"
- Liz Anderson (Chatham County)

User Experience – NCFAST

On-Prem

User experience Metrics: Response times showing user experience of the total transactions executed on-prem.

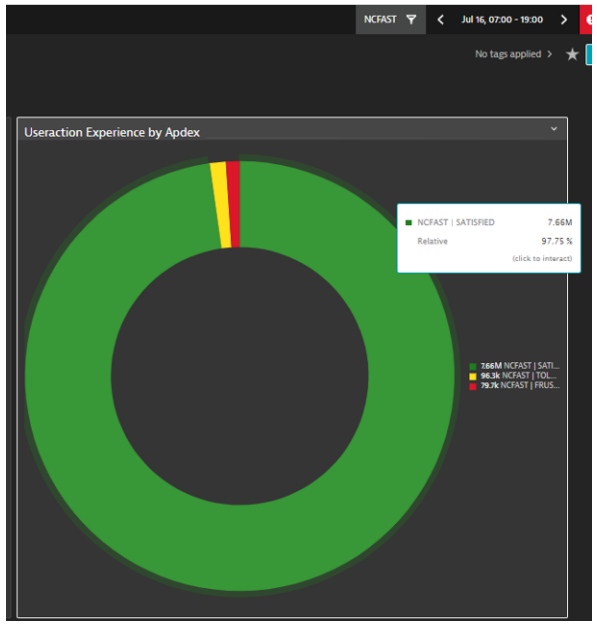
Response time (<4s) - Satisfied - 96%
(4-16 secs) - Tolerating - 2.25-2.50%%
(>16s) - Frustrated - 1.25%



AWS Cloud

User experience Metrics: Response times showing user experience has improved by **2% in "Satisfied"** of the total transactions executed post go-live.

Response time (<4s) - Satisfied - 97-98 %
(4-16 secs) - Tolerating - 1.25%
(>16s) - Frustrated - 1%

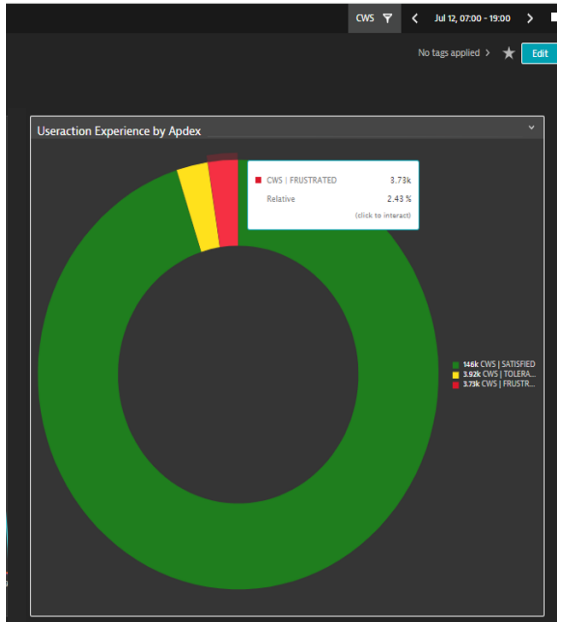


User Experience – CWIS

On-Prem

User experience Metrics: Response times showing user experience of the total transactions executed on-prem.

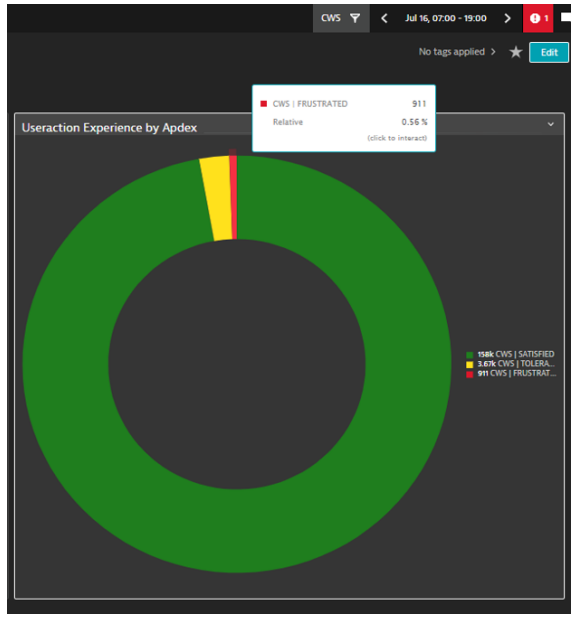
Response time (<4s) = Satisfied - 95.5%
(4-16 secs) - Tolerating = 2.50%%
(>16s) - Frustrated = 2%



AWS Cloud

User experience Metrics: Response times showing user experience under **"Frustrated" has significantly reduced from 2% to 0.5 %** of the total transactions executed post go-live.

Response time (<4s) = Satisfied - 97 %
(4-16 secs) - Tolerating = 2.25%
(>16s) - Frustrated = 0.5%



Any feedback/questions on AIM Phase-1 Go-Live?