

PIC – Next Generation (PIC – NG) - Overview



**U.S. DEPARTMENT OF HOUSING AND URBAN
DEVELOPMENT**

Industry Day - July 2017

Overview

- This morning we'll talk about:
 - PIC today and why it needs to change
 - REAC vision and approach
 - Progress so far
 - Challenges
 - Next Steps
- This afternoon we'll talk about:
 - Demonstration of current solutions
 - What else do we need for PIC?
 - How does VMS fit in?

IMS/PIC

- Inventory Management System - PIH Information Center
 - Receives millions of data points from more than 4250 PHAs
 - Used by HUD to:
 - Calculate Operating Subsidy (\$4.4b)/Capital Fund (\$1.8b)
 - Validate Section 8 HAP (\$18b) and Admin Fee (\$2b)
 - Support program oversight for PHAS and SEMAP
 - Maintain inventory of developments, buildings and units
 - Maintain household and tenant demographics
 - One of HUD's most used systems
 - ~4,250 HUD users
 - ~ 44,200 PHA users
 - ~ 10,000 users per week
 - ~ 60 software vendors supporting PHAs
 - ~ 10 million 50058 submissions

Rationale For Change

- IMS/PIC developed in 1999 – 2000
 - Developed in 2001 for Windows NT, no significant changes after 2007
 - 300+ outstanding enhancement requests
- Availability
 - 2016 - 10 days below 80% availability
 - Average 96% availability for the data center M-F, 7am-9pm
- Integration with PHA applications
 - Difficult/Impossible to integrate PIC information into the PHA's application
 - Batched data and fatal errors causes heavy administrative burden
 - Many PHAs use multiple vendors applications to manage their development, often due to mixed-finance, rental assistance demonstration

Issues with IMS/PIC

- Accuracy of 50058 information
 - Multiple OIG audit findings for inaccuracy of information
 - 1.3 million of 10 million 50058 submissions rejected annually
 - Average error resolution: 1hour
 - 1.3 million hours administrative burden
 - Significant lag between data input and data validation
 - No validation of data prior to submission
 - Correcting/voiding records significantly effects PHA accounting software
 - Not all tenants have a social security number
 - Significant risk of PII exposure

Vision

- Enterprise-ready, G2G and G2B solution which:
 - Improves quality, availability, timeliness, and delivery of information supporting HUD affordable housing programs
 - Fully cloud based – 24/7, no reliance on legacy data center
 - Micro services/APIs to enable full integration of IMS/PIC with PHA application and interagency collaboration
 - Flexible to support evolving program changes - Rental Reform, HOTMA, RAD, MTW Expansion, future deregulation
 - Reduce administrative burden for PHA and HUD staff
 - Integrate collection of affordable housing information
 - Section 8 and 9 Tenant Information (50058, 50059)
 - Abatement, FSS
 - Demolition/Disposition of Public Housing properties
 - Inventory of Public Housing units/buildings
 - Operating Fund (52722/23)
 - Request for Tenancy Approval (52517)
 - UPCS-V Physical Condition
 - Financial Statements, FDS

PIC-NG Approach

- Stakeholder involvement
 - More than 90% of PIC information comes from PHAs
 - PHA Vendors must update software
 - PIC-NG necessary to facilitate business process improvements and regulatory burden relief
- Software development partnership between REAC and OCIO
 - OCIO Infrastructure, Enterprise Architecture, and Information Security
 - REAC Federal software development team (35 FTEs)
 - Cloud infrastructure ~ \$200K development ~\$500K production per year
 - Layered architecture to prevent vendor software lock in
- Development methodology
 - AGILE- Incremental software delivery with increasing functionality

IMS/PIC Tomorrow

- Micro Services / API design
 - PHA users work exclusively in their own applications
 - Vendor software uses IMS/PIC APIs in the background
 - Real time interfaces significantly reduce time between data input and data validation
 - Industry standard, open-source software prevents vendor lock-in
 - Rules engines supports changing program needs
- Enhanced Business Intelligence
 - Ability to slice and dice, drill up and down information
 - Forecasting, risk analysis
 - Geocoding, mapping
 - Accurate information for accurate program funding
 - Export to Office tools, PDF, Word, Excel



PIC-NG Progress

- Software Development
 - USAC Web Service / API in production, CMA currently with OMB
 - HUD Tribal-VASH Portal nearing completion
 - Section 8 50058 processing
 - PII minimization (with PD&R, Housing, business partners, vendors)
- Stakeholder involvement and feedback
 - Monthly industry calls
 - Industry listening sessions
 - Joint development collaboration tools
 - Feedback on development and transition needs



PIC-NG Challenges



- Getting Cloud infrastructure
- Changes to infrastructure requirements
- PHA ability to transition
- Tribal Information

PIC-NG Roadmap

	Current State	Summer 2017	Late Summer 2017	Fall 2017	Spring 2018
Business Functionality					
API Testing	All PHAs	All PHAs	All PHAs	All PHAs	All PHAs
Security Testing				All PHAs	All PHAs
Tenant Verification 50058	FCC/USAC	Tribal HUD VASH	Tribal HUD VASH Section 8 Only PHAs	Tribal HUD VASH Section 8 Only PHAs Section 8 Combined PHAS Section 8 MTW PHAS	Tribal HUD VASH All PHAs
Tenant Reporting		Tribal HUD VASH	Tribal HUD VASH Section 8 Only PHAs	Tribal HUD VASH Section 8 Only PHAs Section 8 Combined PHAS Section 8 MTW PHAS	Tribal HUD VASH All PHAs
PII Minimization			Tribal HUD VASH Section 8 Only PHAs	Tribal HUD VASH Section 8 Only PHAs Section 8 Combined PHAS Section 8 MTW PHAS	Tribal HUD VASH All PHAs
SEMAP			Section 8 Only PHAs	Section 8 Only PHAs Section 8 Combined PHAS Section 8 MTW PHAS	All Section 8 PHAs
Low Rent Inventory Demolition Disposition					Low Rent Public Housing PHAs Low Rent Public Housing PHAs
Programs Supported	FCC Lifeline	FCC Lifeline Tribal Section 8 VA	FCC Lifeline Tribal Section 8 VA Section 8	FCC Lifeline Tribal Section 8 VA Section 8 Section 8 MTW	FCC Lifeline Tribal Section 8 VA Section 8 Section 8 MTW Low Rent Public Housing Operating Subsidy Capital Funding

PIC-NG Next Steps

- PHA testing
 - Expand web service APIs available for PHAs and software vendors
 - Digital certificate security
 - Roll out to all PHAs
- Tenant Verification
 - Integration with EIV
- ONAP VASH
 - Production deployment
 - Program roll-out communication to Tribal Housing Entities
- 50058
 - Data conversion - in progress
 - Enhanced ability to collect and validate
 - Ensure IMS/PIC and PHA information accurate and synchronized



PIC-NG Solution – USAC

What is Lifeline?



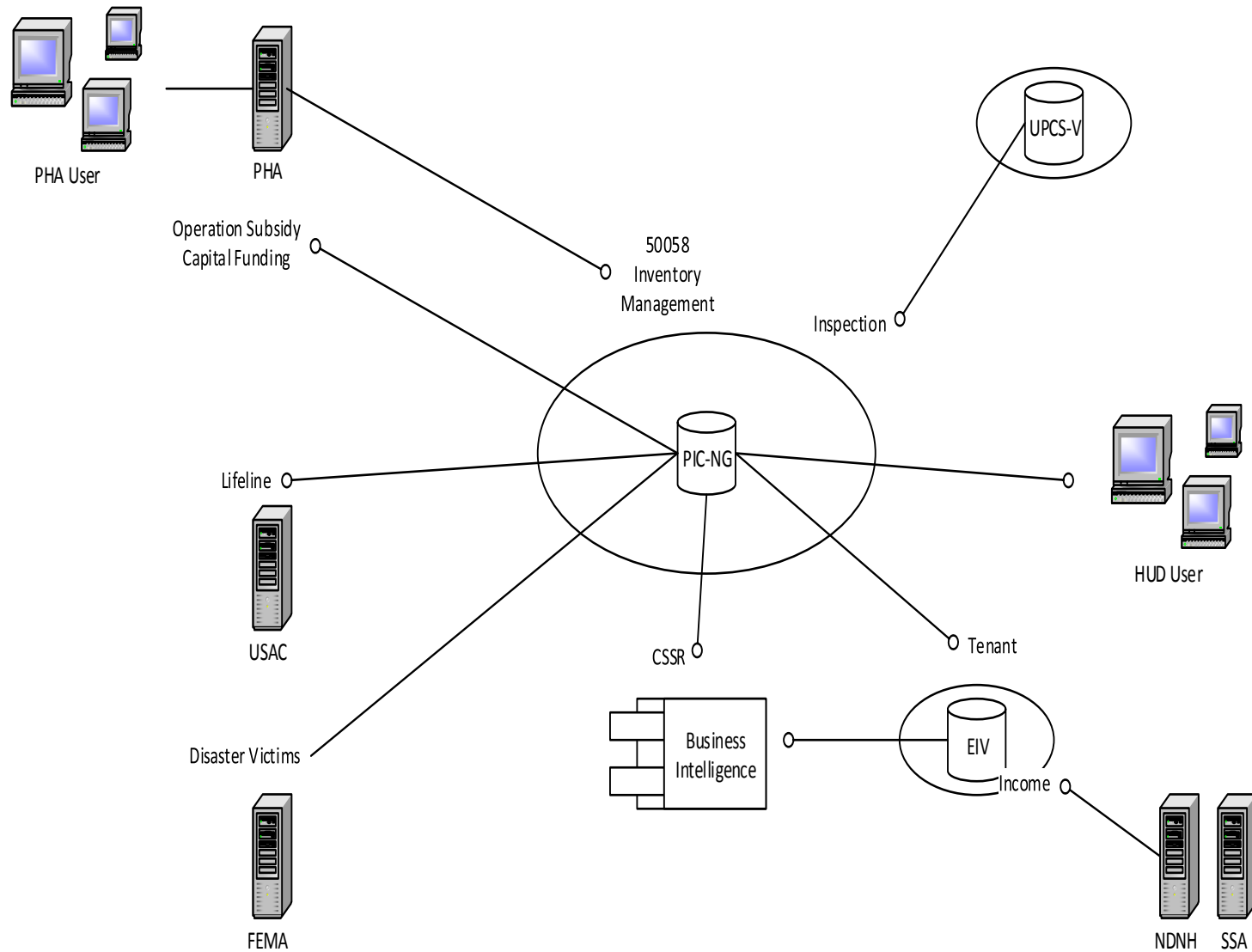
Monthly discount on phone & broadband service

Subscribers prove eligibility through participation in qualifying program or demonstrating income at or below 135% of federal poverty guideline

Available in every state, territory, commonwealth & on Tribal lands

13 million U.S. households participate in the federal Lifeline program

PIC-NG – Solutions in Progress



PIC-NG Solution- VASH

Live Demonstrations:

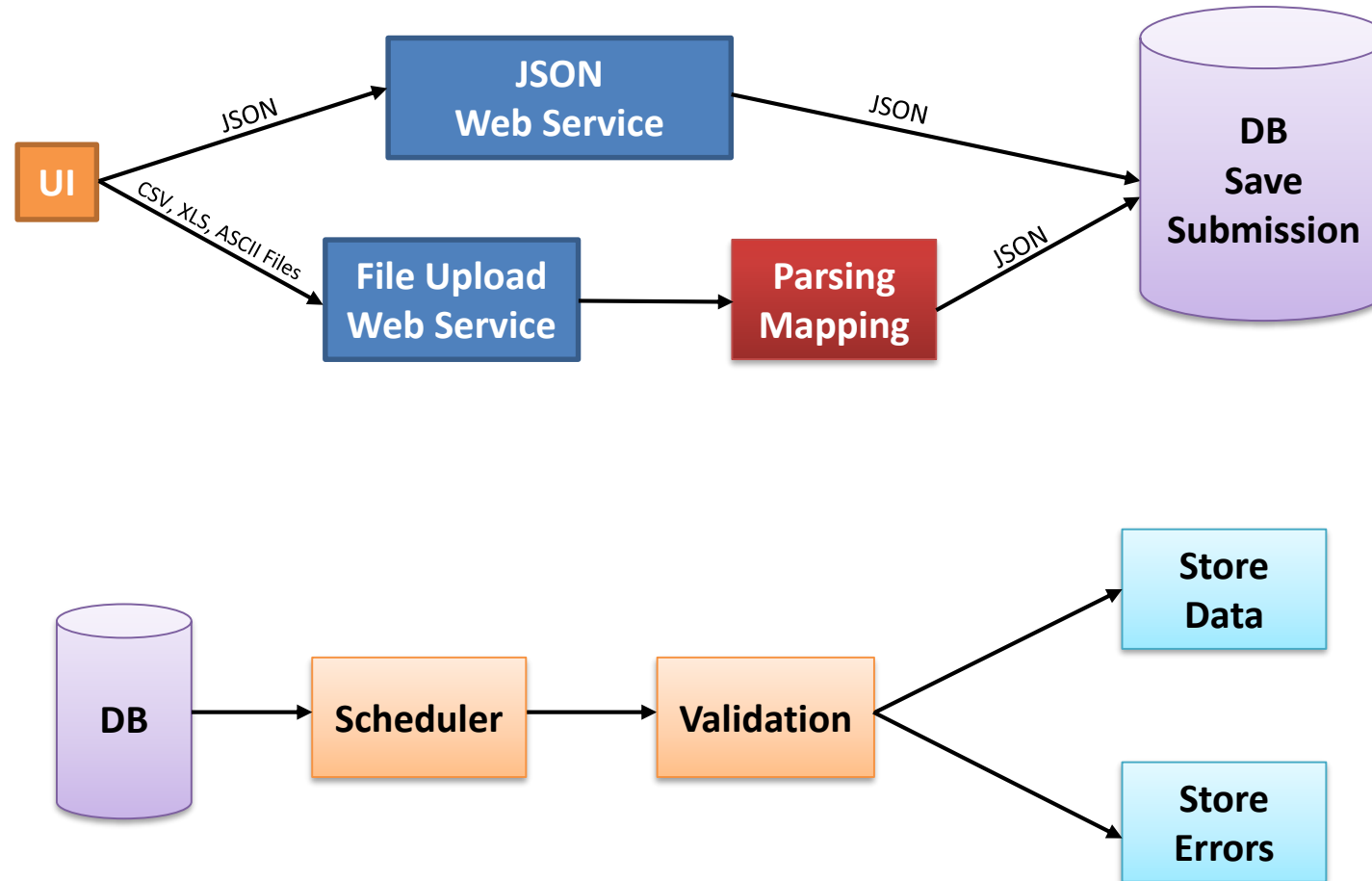
- Tribal VASH: <https://hudapps.hud.gov/picngdemo/web/#/home>
 - J Unit Test In Eclipse: validation/src/test/java/gov/hud/pic/pic/submission/common/ITCommonSectionOne.java
 - DROOLS: In Eclipse: validation/src/main/resources/submission/common/CommonSectionOne.drl
 - API: <https://hudapps.hud.gov/picngdemo/ws/swagger-ui.html>
 - Web page view: <https://hudapps.hud.gov/picngdemo/ws/swagger-ui.html>
 - JSON Swagger view: <https://hudapps.hud.gov/picngdemo/ws/v2/api-docs>
 - 50058 submission: <https://hudapps.hud.gov/picngdemo/web/#/mtwFileUpload>
- Lifeline Program:
- Unique IDs: <https://hudapps.hud.gov/picngdemo/uid/uid>
 - 1st Section (UID Request Lookup):
 - HPIC00 - Requester, can enter SSN and get UID back.
 - 2nd Section (UID Reverse Lookup):
 - HPIC01 - No mask, can enter UID and get full SSN back.
 - HPIC02 - Full mask, can enter UID and get masked SSN back.
 - HPIC03 - Partial mask, can enter UID and get partial masked SSN back.

PIC-NG Solution – Tribal VASH

- Expands HUD-VASH program to target Tribal members
- First cohesive effort to collect tenant data from Tribes
- Funded by grants
- Tool serves as a prototype for future FRS tool
 - Self-publishing API
 - Increased administrative functions
 - Field validation
 - Increased reporting capabilities

<https://hudapps.hud.gov/picngdemo/web/#/home>

PIC-NG Solution – 50058 Submission



PIC-NG Solution Form 52722/23

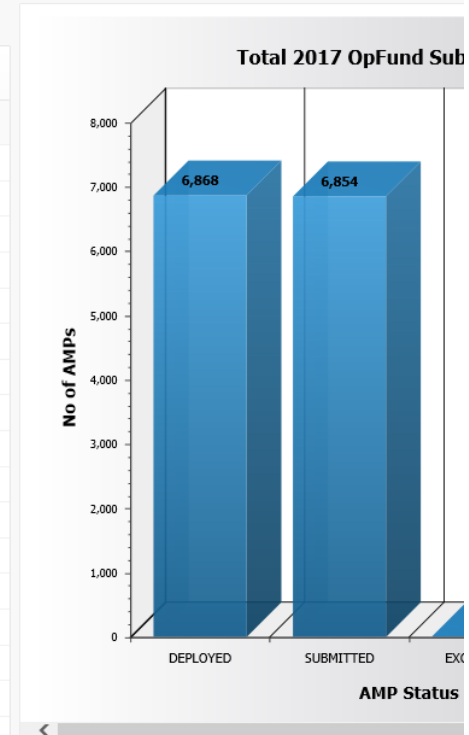
FO Reports & Submissions /

FO 52723/52722 Tool Submissions Summary - 2017

Overall Percent Complete

99.9%

Field Office	Tools Deployed	# Submitted by FO	Exceptions	Missing Submissions	Percent Complete
0APH / Seattle Hub Office	110	109	0	1	99%
0EPH / Portland Program Center	28	28	0	0	100%
1APH / Boston Hub Office	210	210	0	0	100%
1EPH / Hartford Program Center	100	100	0	0	100%
1FPH / Manchester Community Service Center	63	63	0	0	100%
1GPH / Providence Community Service Center	69	69	0	0	100%
2APH / New York City Hub Office	219	219	0	0	100%
2CPH / Buffalo Hub Office	157	157	0	0	100%
2FPH / Newark Hub Office	251	250	1	1	100%
3APH / Philadelphia Hub Office	191	191	0	0	100%
3BPH / Baltimore Hub Office	49	48	1	1	100%
3CPH / Charleston Community Service Center	59	59	0	0	100%
3EPH / Pittsburgh Hub Office	148	147	1	1	100%
3FPH / Richmond Program Center	110	110	0	0	100%
3GPH / Washington, DC Program Center	94	94	0	0	100%
4APH / Atlanta Hub Office	323	323	0	0	100%
4CPH / Birmingham Hub Office	285	282	3	3	100%



[22/23 Link](#)

PIC-NG – Other Solutions in Progress

FEMA

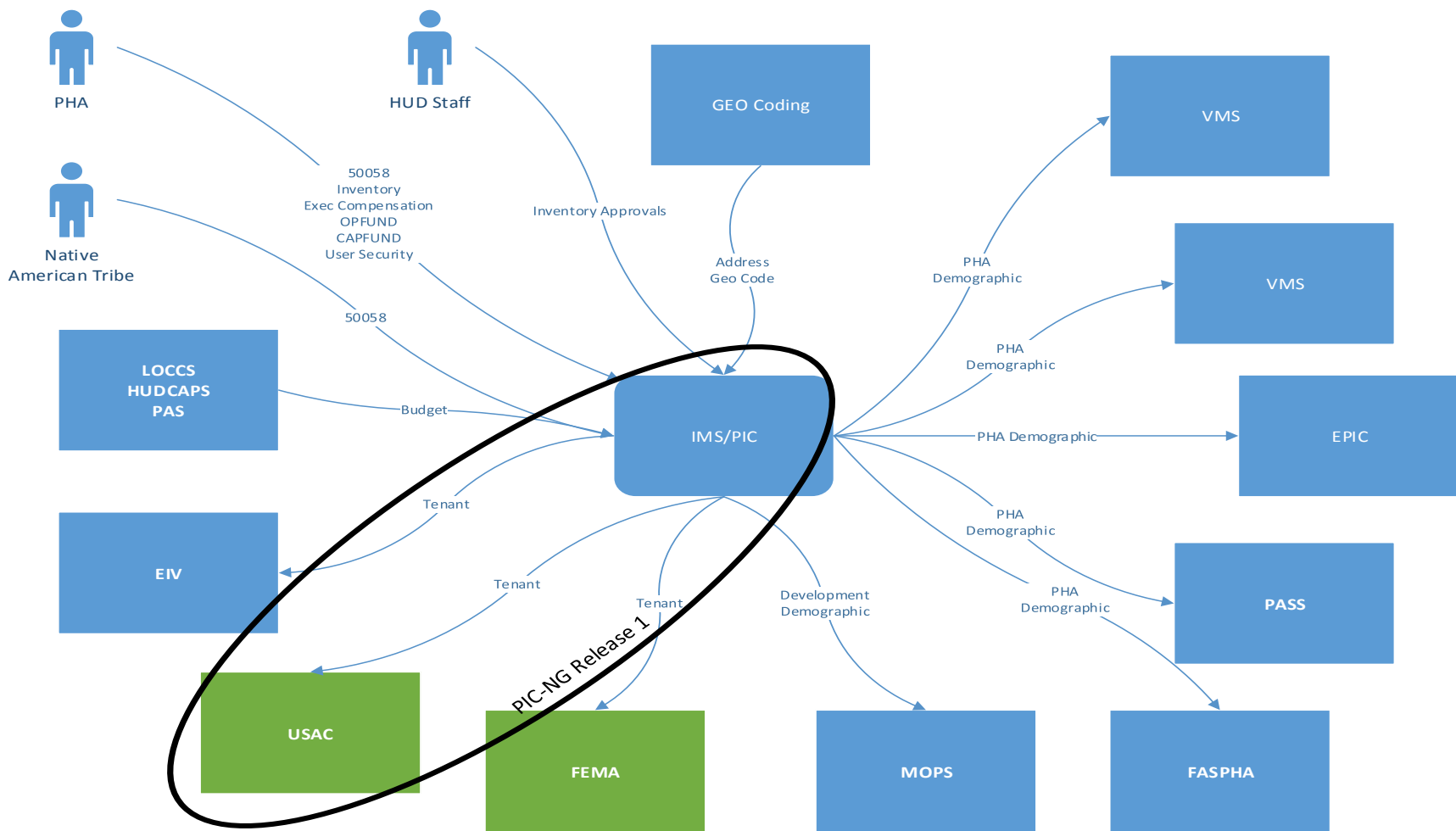
- Computer Matching Agreement between REAC and FEMA
- Disaster victims, FEMA can verify housing assistance in real time
- System to system using web services
- Digital certificate for authentication
- End to end encryption

EIV – Business Intelligence Tools: [MS Link](#) HEIV01

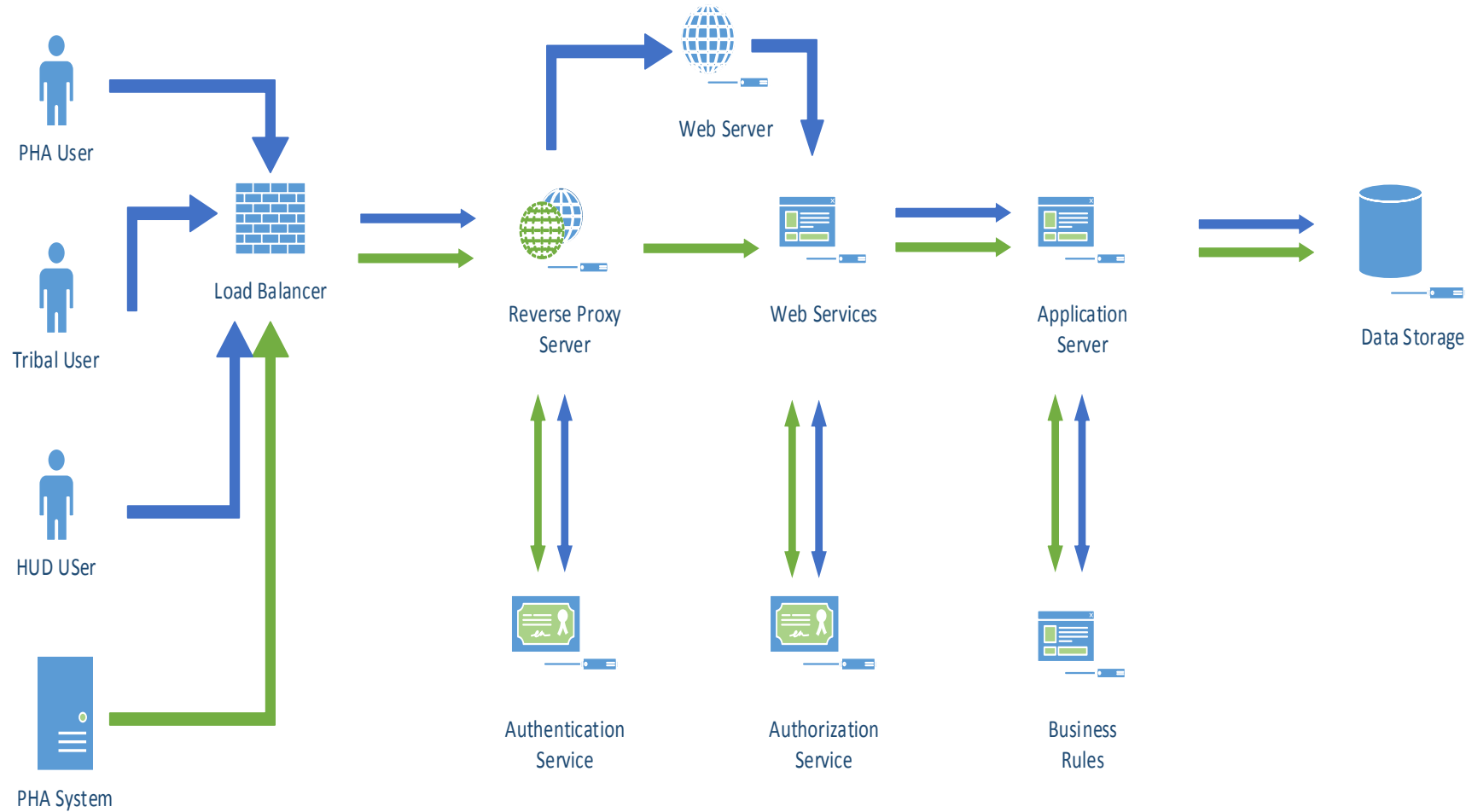
PHA Executive Compensation: [Exec Comp Link](#) MOPHO2- PHA, MOPF04 – HUD
Development

CSSR Reports: [CSSR Link](#), HDCG00

IMS/PIC - Today



PIC-NG - Tomorrow



PIC-NG – 50058 Submissions

- PIC-NG Version 1.0
 - No changes to the 50058
 - TRG for batch submissions does not change
 - Improvements can be made in the 50058 streaming process
 - TRG to cover all 50058 related web services
 - No plans to ‘end of life’ batch submissions
 - Synchronous validation
- PIC-A New Hope Version 2.0 (Ideas)
 - Improvements to 50058 data fields submitted
 - Phase out of batch processing
 - Relax fatal errors to absolute minimum

PIC-NG – 50058 Submissions

- Batch
 - Screen to upload 50058 files
 - Web Service to upload 50058 files
 - Multiple 50058s at a time
 - Convert file formats to JSON
 - Each 50058s extracted and processed by streaming web service
- Streaming
 - Web Service to upload single 50058 – synchronous
 - Initial format/consistency checks – asynchronous
 - Business rules checks
 - Database updates

PIC-NG – Unique Identifiers

- Household
 - Return a Household Identifier for a new admission
- Household Member
 - Return a random identifier unique to a SSN for each member
 - Are check digits needed
- Streaming allow submission of existing information or new identifiers?

PIC-NG – Void / Correction

- Void
 - Store information based on 50058 effective dates
 - Submit a 50058 to fill the ‘hole’
 - Assume prior 50058 carries forward
 - What happens if there is an error now in the subsequent 50058 information
- Correction
 - Allow just the field(s) corrected to be submitted

PIC-NG – Data Conversion

- Initial IMS/PIC to PIC-NG
 - Existing IMS/PIC information has ~ 15 % errors
 - REAC will/is correcting know errors
 - Day one information will be taken from IMS/PIC
- On going
 - PHAs need a way to ensure HUD and PHA data in sync
 - By household, by building, by development

PIC-NG Discussion –TRG

- What is needed
 - JSON format – RAML for all Web Services
 - Rules from rules engine
 - Rules by action type
 - Security requirements
 - Submission identifier
 - Household Identifier
 - Household Member Identifier
 - Synchronous web services – how long is too long to wait
 - Submission status
 - Error messages by rule
 - Break existing rules into multiple atomic rules

PIC-NG Discussion –Processing time

- How much is too much?

PIC-NG – Layered Architecture

- Security
 - Authentication
 - Authorization
- Web
 - Presentation
 - Web Services
- Application
 - Business Rules
 - Workflows
- Data
 - Access
 - Storage

PIC-NG – Security Layer

- Authentication
 - Siteminder
 - Will be challenged first time when trying to access protected resource
 - Infrastructure team is working on enabling Digital Certificates
- Authorization
 - WASS with roles and actions for that PHA
 - PHA applications will have one role that allows access to all PIC-NG
 - PHA users, roles specific to their job

PIC-NG – Web Layer

- Presentation
 - Angular 2
 - Browser independent
 - Support for modern browsers not just IE
 - Support mobile devices
 - Uses same Web Services
- Web Services
 - JSON RESTful
 - Called directly from PHA applications
 - Called from presentation layer for users
 - All interaction is through Web Services

PIC-NG – Application Layer

- Business Rules
 - Rules engine , ability to share the rules
 - Database functions, called from rules engine
 - DROOLS
- Workflows
 - Ensure business processes have automated workflow
 - HUD and PHA users know the status of a process in the lifecycle

PIC-NG – Data Layer

- Access
 - Database Procedures and Functions
- Storage
 - Entity Attribute Value model
 - Temporal
 - Effective to and from (ability to maintain history)
 - Valid/ to and from (during what time period did we believe this information to be accurate)

PIC-NG

Questions or Comments?

Please email PICNG_REAC@HUD.gov

https://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/systems/pic/pihinfoctrnextgen
https://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/systems/pic/pihinfo-nextgen-dev/info