



IUDX v3.5.0 Release notes

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1 Introduction

We are happy to announce the IUDX-v3.5.0 release for the core software components and platform components for India Urban Data Exchange (IUDX). It incorporates feature upgrades and enhancements from Release 3.0 which was the 3rd production release for IUDX.

This note provides a list of feature additions and other work components that form the part of this release.

2 Release v3.5.0 Highlights

Key features of this release are:

- Extensible Consent Framework: Framework to integrate external policy decision services, called Access Policy Domains (APD) with IUDX Authorization Service to provide extensible access control service
- IUDX Sandbox with access to datasets for enhanced application development, integration and testing
- Enhanced Analytics Framework: Advanced analytics for Transit Management systems and improved Analytics backend
- Kubernetes based deployment of IUDX and new docker registry based on Github Container registry (GHCR)
- Non-IUDX Resource Server Integration: External GIS Server integration
- Automated Test Framework integrated with GIT for Enhanced Stress, Load, Penetration and Security testing and reporting
- Enhanced Media Server: Cloud Media Server and APIs
- Developer documentation portal providing user guides, documentation etc. for IUDX developer community

3 Release v3.5.0 Details

3.1 Deployment Framework

- New Docker registry based on GitHub Container registry (GHCR) with improvised tagging, version control and naming strategy
- Enhanced Kubernetes based deployment of IUDX platform using Helm charts. IUDX can now automatically scale based on load
- New Certificate management system for managing and renewing the SSL/TLS certificates of IUDX components in Kubernetes
- Improvised Docker stack files, deployment suites and scripts with best in class security practices for docker images
- Enhanced Automated Test Framework integrated with GIT and associates with appropriate badges, links to test reports for Stress, Load, Penetration, Security and Integration testing
- New Advanced Monitoring Framework integrated with a telegram for alerting administrators

- All the modules are developed to operate as a Multi-node cluster. Enables High Availability, Load balancing, and Efficient operation

3.2 Resource Server

- Resource Access Service
 - New APIs
 - Audit / Metering APIs for consumers, providers and delegates
 - **/consumer/audit**: This API shall allow IUDX consumer to understand their resource usage
 - **/provider/audit**: This API shall allow IUDX Providers to understand their resource usage
 - Admin API for resource management
 - Admin APIs for updating item-id and unique attribute of a resource and updating token invalidation
 - Broadcast Integration with RabbitMQ
 - Resource Server integration with RabbitMQ: to broadcast invalid token information provided by Authorization Server, to broadcast Unique Attributes Information published by IUDX Admin
 - Invalidation of streaming subscription
 - With release v3.5.0, a consumer should use refresh subscription API (at least once in 12 hours) to keep their subscription live
 - The streaming will be cancelled automatically by the resource server if the subscription is not refreshed
- File Server
 - New APIs
 - **/iudx/v1/upload**: File server now allows a user to upload "ONLY" a meta-data which is associated to a file hosted in an external server
 - Identity-based access restriction
 - With release v3.5.0, all API calls will expect a token to be presented.
 - Metering and Auditing Service
 - Integrated with immutable database (ImmuDB)
 - Broadcast Integration with RabbitMQ
 - Integration with RabbitMQ to receive invalid token information
- Non-iudx resource server support (External GIS Server Integration with IUDX)
 - New APIs
 - **/ngsi-ld/v1/entities**: is used by IUDX Data Consumers to consume data (external links) from the IUDX platform.
 - **admin/gis/serverInfo**: is used by IUDX Admins to create, update and delete server information
 - Identity-based access restriction
 - With release v3.5.0, All API calls will expect a token to be presented.
 - Metering and Auditing Service
 - Integrated with immutable database (ImmuDB)
 - Broadcast Integration with RabbitMQ

- Integration with RabbitMQ to receive invalid token information provided by Authorization Server
- Updates, bugs, and performance fixes
 - Library, Security Updates
 - Enhanced Validation and cache performance

3.3 Authorization Server

- New Features
 - A new IUDX specific role has been introduced which is responsible for performing any administrative tasks related to the APD (referred to as Data Trustee).
 - New APIs
 - New Authorisation server APIs for Create, List, Update and Delete of APD by a Data Trustee
 - New Access Policy Domain (APD) Server APIs to read and verify User Class
 - Enhanced AAA server Policy flows for APD server integration for Create, Verify policy
- Updates, bugs, and performance fixes
 - Enhanced Validation

3.4 Catalogue Server

- New Features
 - Implemented an alpha version of natural language queries supporting free form human interpretable sentences to search for datasets
 - Implemented geocoding/reverse-geocoding support (using Pelias) to further enhance natural language queries
- Updates, bugs, and performance fixes
 - Enhanced Validation

3.5 Sandbox

- An IUDX powered application where consumers can discover, download and experiment with comprehensive sample datasets derived from IUDX data sources
- A user interface modeled on the IUDX Catalogue and designed to be similar to other popular open dataset and sandbox applications
- A sandboxed python code execution environment
 - Students, data scientists and other similar consumers can quickly get a feel of IUDX data
 - Consumers can code, save and download their sandbox code bases
- Integration with IUDX AAA for authentication and access control to public and protected IUDX data sources
- Curated data science notebooks to give analytic insights into popular data sources in IUDX

3.6 Video Server

- Development and testing of IUDX Cloud Media APIs for:

- Request publish of on-demand media streams
- Request access to such on-demand streams
- Discovery of Cloud Media Servers

3.7 Analytics Framework

- Advanced algorithms for transit management data
 - Algorithms for Route Segmentation
 - Algorithms for Traffic delay analysis
 - Algorithms for stop coverage analysis
- Enhanced backend framework
 - Scalability improvements in backend engine
 - Performance enhancements

3.8 Additional Testing

- Integration with Automated Test Framework for
 - Automated Unit Testing
 - Automated Code Coverage Testing
 - Automated Load Testing
 - Automated Security Testing
 - Automated Integration Testing
- Enhanced Input parameter validations

3.9 Data Quality Framework for Temporal Data

- Backend scripts to assess data quality for temporal data sources
- Scripts to evaluate data format adherence, time of arrival statistics, presence of duplicates etc.

3.10 Catalogue and Provider UI Panels

- New features
 - Query builder to download datasets based on temporal query
 - Video playback on a popup for video resources types
- Updates, bugs, and performance fixes
 - Minor enhancements on UX design
 - Library, Security Updates

3.11 Maintenance and Support

- Minor bug fixes on all API servers
- Updated API documentation

4 Key Links

- Source Code
 - Resource Server - <https://github.com/datakaveri/iudx-resource-server>
 - File Server - <https://github.com/datakaveri/iudx-file-server>
 - GIS Server (Non-iudx resource server support) - <https://github.com/datakaveri/iudx-gis-interface>

- REDIS based cache layer - <https://github.com/datakaveri/latest-ingestion-pipeline>
- Catalogue Server - <https://github.com/datakaveri/iudx-catalogue-server>
- Authorization Server - <https://github.com/datakaveri/iudx-aaa-server>
- New Kubernetes Framework - <https://github.com/datakaveri/iudx-deployment>
- Advanced Monitoring: <https://github.com/datakaveri/iudx-deployment/tree/master/Docker-Swarm-deployment/single-node/monitoring-stack>
- Video Server Backend - <https://github.com/datakaveri/iudx-video-backend>
- Analytics Engine - <https://github.com/datakaveri/iudx-analytics-engine>
- Analytics Applications - <https://github.com/datakaveri/iudx-analytics-applications>
- Data Quality for Temporal Data sources - <https://github.com/datakaveri/data-quality-assessment>
- Sandbox backend - <https://github.com/datakaveri/iudx-sandbox-backend>
- Test Reports
 - Resource Server
 - Unit tests available [here](#)
 - Coverage available [here](#)
 - Performance tests available [here](#)
 - Security tests available [here](#)
 - Integration tests available [here](#)
 - Catalogue Server
 - Unit tests available [here](#)
 - Coverage available [here](#)
 - Performance tests available [here](#)
 - Security tests available [here](#)
 - Integration tests available [here](#)
 - Authorization Server
 - Unit tests available [here](#)
 - Coverage available [here](#)
 - Security tests available [here](#)
 - Integration tests available [here](#)
 - File Server
 - Unit tests available [here](#)
 - Coverage available [here](#)
 - Security tests available [here](#)
 - Integration tests available [here](#)
 - Non-IUDX (GIS) Server
 - Unit tests available [here](#)
 - Coverage available [here](#)
 - Security tests available [here](#)
 - Integration tests available [here](#)

- API Docs¹
 - Catalogue Server - <https://api.catalogue.iudx.org.in/apis>
 - Resource Server - <https://rs.iudx.org.in/apis>
 - Authorization Server - <http://authorization.iudx.org.in/apis>
 - File Server - <https://file.iudx.org.in/apis>
 - Data Ingestion Server - <https://push.iudx.org.in/apis/>
 - Non IUDX Resource Server - <https://gis.iudx.org.in/apis>
- UI Links²
 - Catalogue UI - <https://catalogue.iudx.org.in/>
 - Consumer UI - <https://consumer.iudx.org.in/>
 - Provider UI - <https://publisher.iudx.org.in/>
 - Sandbox UI - <https://sandbox.iudx.org.in/>
 - Developer Docs UI - <https://docs.iudx.org.in/>

5 Features planned for upcoming releases

- Enhanced sandbox: For private data support
- Async API Support for getting data as files for large data downloads
- Proxy Resource Servers to ease integration of external resource servers with IUDX
- Automated file archival service for enhanced data governance
- Advanced Monitoring Stack for liveness check of IUDX Systems
- Consumer/User Rating APIs
- Access Policy Domain Server development and integration with IUDX Auth server
- API Metering based access control
- DevOps and Deployment
 - Kubernetes support for addition CSPs
- Continued Enhancements
 - Testing
 - Additional DB support integration with IUDX Data Access APIs
 - System-Level Upgrades
 - Developer Network Support
- AI/ML frameworks:
 - Rules engines
 - Kubernetes based deployments
 - Improved/Custom visualizations

¹ The links will be updated to the current release once IUDX migrates to the latest release (Tentatively available by April 15)

² The links will be updated to the current release once IUDX migrates to the latest release (Tentatively available by April 15)

THANK YOU