



Deploying New Financial Service Offerings Quickly

Fluxlets, the subject of this white paper, are financial software building blocks that allow you to deploy new service offerings quickly. Using Fluxlets combined with the Flux file orchestration platform, you can roll out well-tested and reliable services such as:

- **File Receipt and Acknowledgement:** Register the receipt of a file and send an acknowledgement of receipt.
- **File Publishing:** Files are accumulated over time or until a threshold is reached, at which time the accumulated files are archived or otherwise processed.
- **File Forwarder:** Files are forwarded, with their contents unchanged, to another location for subsequent processing.
- **File Ingestor:** Incoming files are 'ingested' into a database, information warehouse, or archive, perhaps after some transcoding or other kind of processing.
- **File Workflow Provisioning:** File workflow provisioning, sometimes called onboarding, is a mechanism to collect information regarding a customer and process that information to set up a subscription delivered in the form of files.

Numerous financial institutions already utilize the Flux file orchestration platform to provide services such as check image exchange, payment clearinghouses, wealth management, corporate treasury management, and payment forwarding.

Fluxlets represent the next step in creating new services more quickly and with more flexibility to meet changing customer demands. Dig deeper below to find out how Fluxlets, together with the Flux file orchestration platform, can help you stand-up new financial services efficiently, with a minimum of fuss.

Flux – A File Orchestration Platform

Flux assists enterprises in provisioning, onboarding, scheduling, tracking, and reporting an enterprise's file orchestration processes. These orchestrations vary from simple file transfers to highly complex workflows involving extensive processing, many routes, varied alerts, and complex decisioning.

Flux has deep expertise in facilitating financial institutions (e.g., banks, lenders) and financial service providers (e.g., software vendors and service bureaus) in effectively orchestrating files to create new revenue opportunities and reduce expenses.

Flux's file orchestration facilities have evolved over the past 12 years, providing institutions significant competitive advantage in delivering highly-available and reliable solutions to their customers.

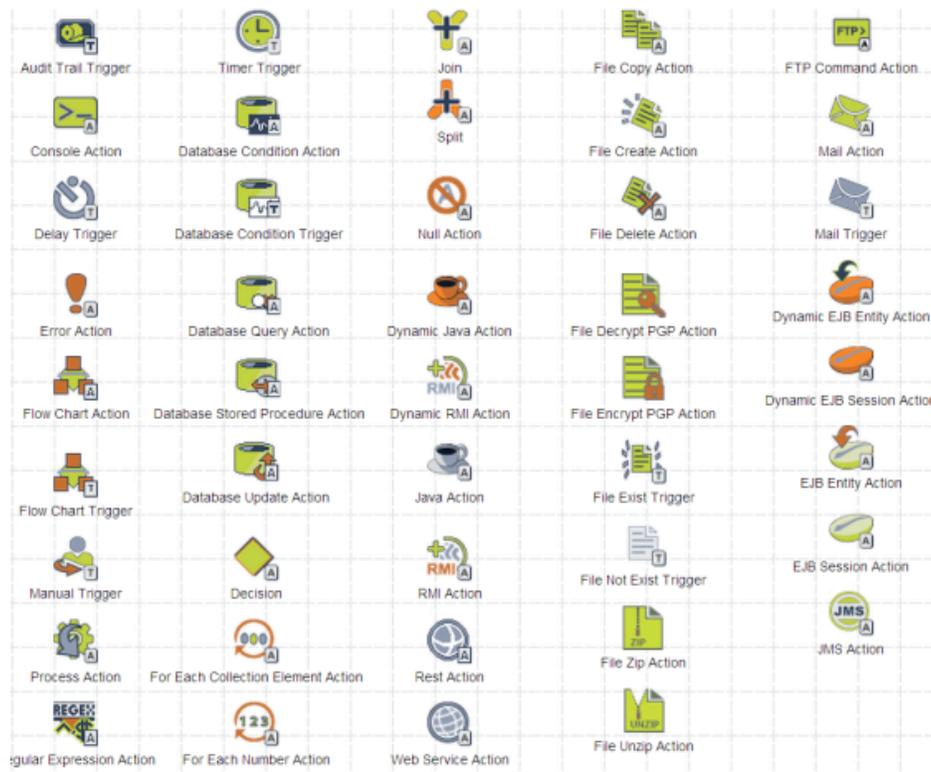
The cornerstone of Flux's technology is its orchestration engine. Optimized for file orchestration, Flux orchestrates the receipt, processing, creation, and delivery of an enterprise's content to its customers, partners, and internal departments. Flux's file orchestration facilities simplify and extend financial institutions' operations by providing:

- Graphical, browser-based, drag and drop workflow designer
- Clustering support for high volume and tight SLA processing loads
- Load balancing and failover for scalability and high availability
- Connectivity options for multiple delivery channels using FTP, SFTP, and other protocols
- Flexible service level agreement definitions
- Written in pure Java and portable to any platform with an available JVM
- Systems management functionality to provide proactive monitoring
- Seamless interfaces with a variety of host legacy systems, enterprise systems, networks, messaging types, relational databases, and Web services
- High volume, 24x7 continuous processing support for mission-critical business needs throughout the enterprise

Fluxlets – File Orchestrations Built Atop Flux

Fluxlets are small reusable orchestrations built atop the Flux platform. While the amount of effort to develop such orchestrations is small as compared to custom code development, the power and sophistication of a Fluxlet can be quite extensive. Flux's integration to databases, web services, mail servers, FTP and file transfer services, and Flux's extensibility (via Java) allows the creation of complex orchestrations in very short timeframes. And Flux's configuration features make each Fluxlet easily customizable to suit a particular need or circumstance.

Fluxlets are constructed from the palette of Flux capabilities, shown on the next page:



Flux Palette of Triggers and Actions – Actions sampling of the palette of capabilities that can be assembled into Fluxlets.

These orchestrations are assembled graphically into file orchestration workflows, directing the processes applied to a file in an intuitive and business-understandable manner. 'Happy path' processing as well as exceptional and error file flows can all be depicted using the workflow designer embedded within Flux. Flux file orchestration provides features and facilities supporting use cases requiring:

File Splitting	File Extraction	File Replication
File Conversion / Transcoding	File Reformatting / Transformation	File Matching and Merging
File Concatenation	File Aggregation	File Validation
File Compare	File Parsing	File Summarization
File Archiving	File Sorting	File Loading (to databases and ETL tools)
File Generation/Creation	File Ingestion	File Injection
File Copy	File Processing - local/remote	File Deletion
File Renaming	File Encrypting and Decrypting	File Versioning
File Scheduling	File Detection	File Transfer

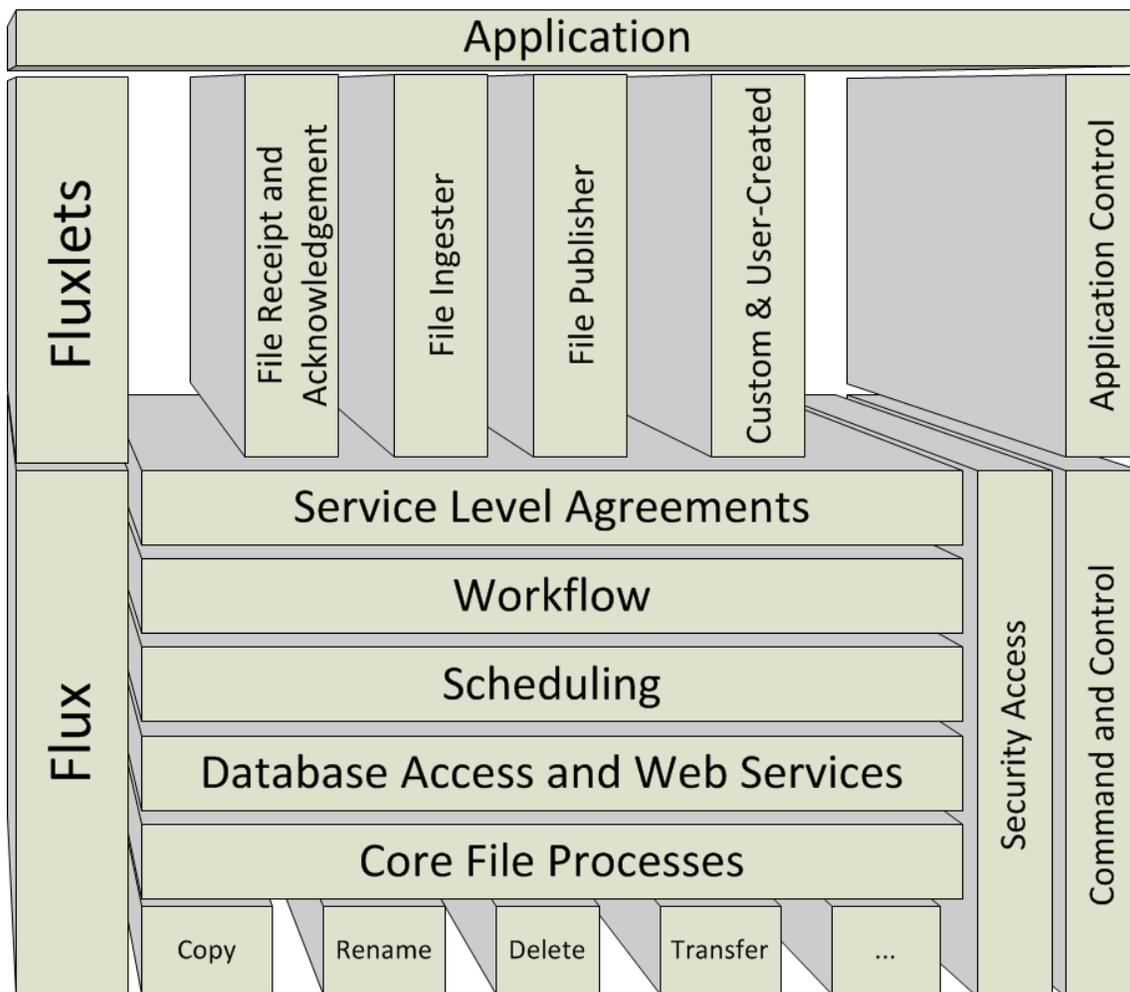
Fluxlets are designed to facilitate success. Fluxlets provide opportunities to create new revenue opportunities or reduce the expense of existing processes by reducing the time it takes an enterprise to take a product or service concept from the whiteboard to the keyboard.

When completed, a Fluxlet is a bundled set of one or more workflows, a collection of Java code for any required tailoring, and associated documentation regarding the business case, candidate usage, configuration properties, and points of customization.

Fluxlets are intended to be reused in multiple applications – so strict attention is paid to ensuring that each Fluxlet is easily configured. Fluxlets are pre-configured to execute a quick self-verification to ensure their deployment is valid and complete in a Flux platform.

Fluxlets and Flux

Fluxlets leverage the Flux platform to facilitate building reliable and full-function applications quickly.



Deployment Architecture for Flux File Orchestration Platform, Fluxlets, and User Application

The Flux platform provides a diverse set of capabilities that, combined with Fluxlets, provides for a powerful and highly capable deployment architecture. The capabilities include, for example:

- Namespaces that can be configured with unique processing and security attributes. When Fluxlets are assigned to these namespaces, they take on the processing and security constraints defined by the namespace.
- Sophisticated variable substitution to allow the dynamic setting of values – without code changes.
- Agents that allow the execution of processes on hardware remote from the Flux engine, allowing Fluxlets, within their workflows, to utilize the dedicated resources of remote machines.
- Peer architecture that provides scalability, load balancing, and fail-over.

Sample Fluxlets

File Receipt and Acknowledgement

A common file orchestration need is to register the arrival (i.e., receipt) of a file into a system, into a database, and then send an acknowledgement of receipt. This circumstance occurs frequently in receiving payment files and other financial transactions. This sounds easy initially, but additional analysis exposes increased complexity. For example – what started out as simply registering receipt of a file and sending an acknowledgement expands into:

- The incoming files are located in different directories on multiple servers.
- Some of these servers are simple file shares, some are FTP and SFTP servers.
- The incoming files may be encrypted, depending upon the type of file or the name of the file.
- Duplicate checking must be performed on incoming files to ensure the same file does not arrive from the sender and get processed two or more times. This duplicate checking differs based on incoming file type and the sender.
- Not only must incoming files be registered and acknowledged, but the lack of arrival of a file by a specified time or event must generate a notification to operations staff and the sender.
- The routing and format of the acknowledgement is queried from a customer contacts database.
- The acknowledgement may need to be sent as a file, a web service call, or as an encrypted email.

- Outgoing files may need to be encrypted.
- Late arriving files need to be acknowledged back to the customer as being late, and the content of the acknowledgement will differ on these late arriving files. In addition, late arriving files need to have an alert email sent to operations staff so that they can follow up with the sender.

File Publishing

Another common occurrence in payment systems are situations where files are accumulated over the course of some interval (e.g., some number of hours or minutes, or until some number of files is present, or until some total size of files is achieved). These files are processed and then 'published' into reports, forms, and alternate file formats – for submission to other systems or third parties.

Examples include taking payment feeds and publishing into ISO-20022 format or IBM CPCS strings for forwarding to a bank host system, or payment reports required to satisfy audit and compliance regulations such as Suspicious Activity Reports (SARs - FR2230) and Currency Transaction Reports (CTRs - FinCEN Report 104).

File Forwarder

A file forwarder involves forwarding files – with their contents unchanged – to another location for subsequent processing. There are many instances where remote offices or branches accumulate payment files constructed by their in-branch or back-office counter solutions.

Forwarding these files to a central office, either individually or aggregated into larger files on a timed basis, with controls to ensure all files are successfully transferred and then balanced with the central office, is quite common within financial solutions for treasury management and item processing. Forwarders also provide multi-destination routing, transmitting files to multiple locations (e.g., to a main site and a backup or archive site) when needed.

File Ingestor

A file ingestor takes incoming files and 'ingests' them – generally into a database, information warehouse, or archive. Document imaging and payment systems will frequently take feeds of incoming files containing images and load them into image archives.

File Workflow Provisioning

File workflow provisioning, sometimes called onboarding, is a mechanism to collect information regarding a customer or consumer and process that information to set up a route or subscription to information delivered in the form of files. Often the provisioning information is an incoming file itself, but it can also be provided via interactive input from an operator or via incoming messages delivered, for instance, via web service calls.

Assembling Fluxlets into Applications

With some care and thought, Fluxlets can be assembled and integrated to create entire applications. The key difference between a Fluxlet and a complete application is the addition of application specific plug-ins or user-supplied Java code to address specific file content, such as file or application-specific parsers, transcoders, and formatters. In addition, some number of Fluxlets may need to be assembled and integrated to provide all the functionality required of the application. Consider the following examples as candidate applications expedited and deployed via Fluxlets.

Least Cost Routing

Least cost routing opportunities arise in payment and banking systems when there exist multiple channels to clear individual payments, and incoming payment files that contain items that can be cleared in multiple ways. For instance, an incoming check payments file may have items that can be cleared directly with another bank via a correspondent banking relationship, via ACH, via wire transfer, via a payments exchange provider, or with the Federal Reserve Bank.

Each clearing channel has different costs and benefits, and various rules must be met in order to use the different channels. Some channels provide very quick availability of funds – useful for clearing high dollar items quickly. Other channels can clear large volumes of items at a lower cost – but not as quickly – maybe some number of hours instead of seconds. As a payment file arrives, it must be processed and split into one or more outgoing payment files for clearing based on an analysis of each payment contained in the file.

File Delivery Subscription

A file delivery subscription provides users with the ability to request the delivery of files, to a destination of their choosing, based on a schedule of their choosing. The selection criteria of what is being requested, such as via search filters and across specified time intervals of interest, is also available.

Many corporate treasurers require payments information delivered for specific periods of time, e.g., daily, monthly, quarterly, often with specific search criteria applied in filtering the results. These results are packaged and delivered, on a user-defined schedule and in a user-specified format and to one or many delivery channels (e.g., email, CSV file (suitable for spreadsheet analysis), PDF, or user-defined file format).

Digital Asset Clearinghouse

A digital asset clearinghouse provides users the ability to submit, store, and request specific digital assets with specific processing actions applied (e.g., image transcoding). Policy and processing decisions regarding an asset's ingestion, storage, access, and delivery are frequently decided on a per-format basis.

Digital clearinghouses automate these procedures to the fullest extent possible in order to achieve operational efficiency. The identification, validation, and characterization of specific assets is frequently necessary during routine operation of such clearinghouses.

Experience Fluxlets

To experience the power and capability of Fluxlets, first download and install an evaluation copy of the Flux File Orchestration Platform from flux.ly/download. It only takes 3-5 minutes depending upon your internet speed. Next, to obtain a Fluxlet, go to flux.ly/solutions, fill out the request form, and a download link will be sent to you. Installation instructions will follow.

About Flux

Flux orchestrates file transfers and batch processing for banking and financial services.

First released in 2000, Flux has grown into a financial platform that the largest US, UK, and Canadian banks and financial services organizations rely on daily for their mission critical financial systems.

Flux

+1 702-789-0907

sales@flux.ly

www.flux.ly