SWIM

CSS-Wx data availability

Presented to:	Friends & Partners in Aviation Weather (FPAW 2024)
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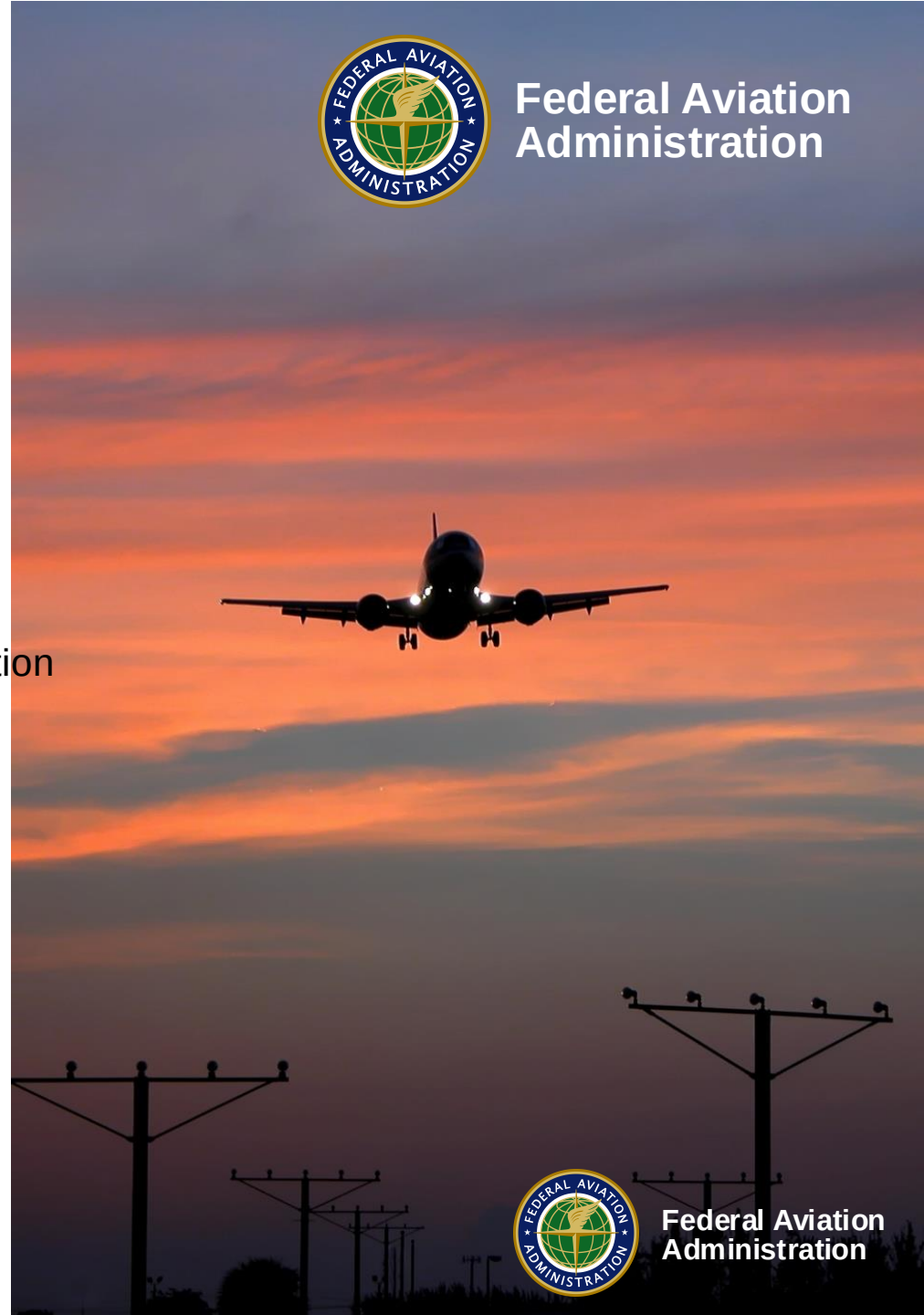


CSS-Wx CNODE

Overview

- Common Support Services – Weather (CSS-Wx) is the single provider of weather data, products, and imagery within the National Airspace System (NAS), using standards-based weather dissemination via System Wide Information Management (SWIM)
- Provides products via JMS and Web Service(s)
  - The WebService is using the Solace MicroGateway
  - CSS-Wx C-Nodes will publish Wx data to the ZTL/ ZLC Solace appliances (NEMS sites)
- NEMS will support consumers at all NESGs
  - Via VPN over internet at Atlantic City and Oklahoma City
  - Via dedicated telco dropped to Atlanta and Salt Lake City
- A variety of Wx data products will be made available to Non-NAS Consumers via combination of Solace NESG interfaces and the SWIM Cloud Distribution Service (SCDS)
- NEMS Content Based Routing (CBR) will be utilized to route Wx data products based on their JMS Property field attributes to the appropriate NEMS queues and topics
- RESTful Web Service or JMS Request/ Response will be used for Internal NAS Consumers
- Web Service-based Wx SWIM Services will NOT be made available to Non-NAS Consumers
- Authentication between Wx Producer/ Consumer systems and SWIM will rely on the existing NEMS username and password mechanism

Note: CSS-Wx does not entail any sensitive data which can be distributed to external users in the NAS.

NAS Service Registry & Repository (NSRR)

NSRR is a SWIM-supported capability for storing, sharing, and managing information about all SWIM-enabled services, both currently available and under development. Request an account at: https://nsrr.faa.gov/

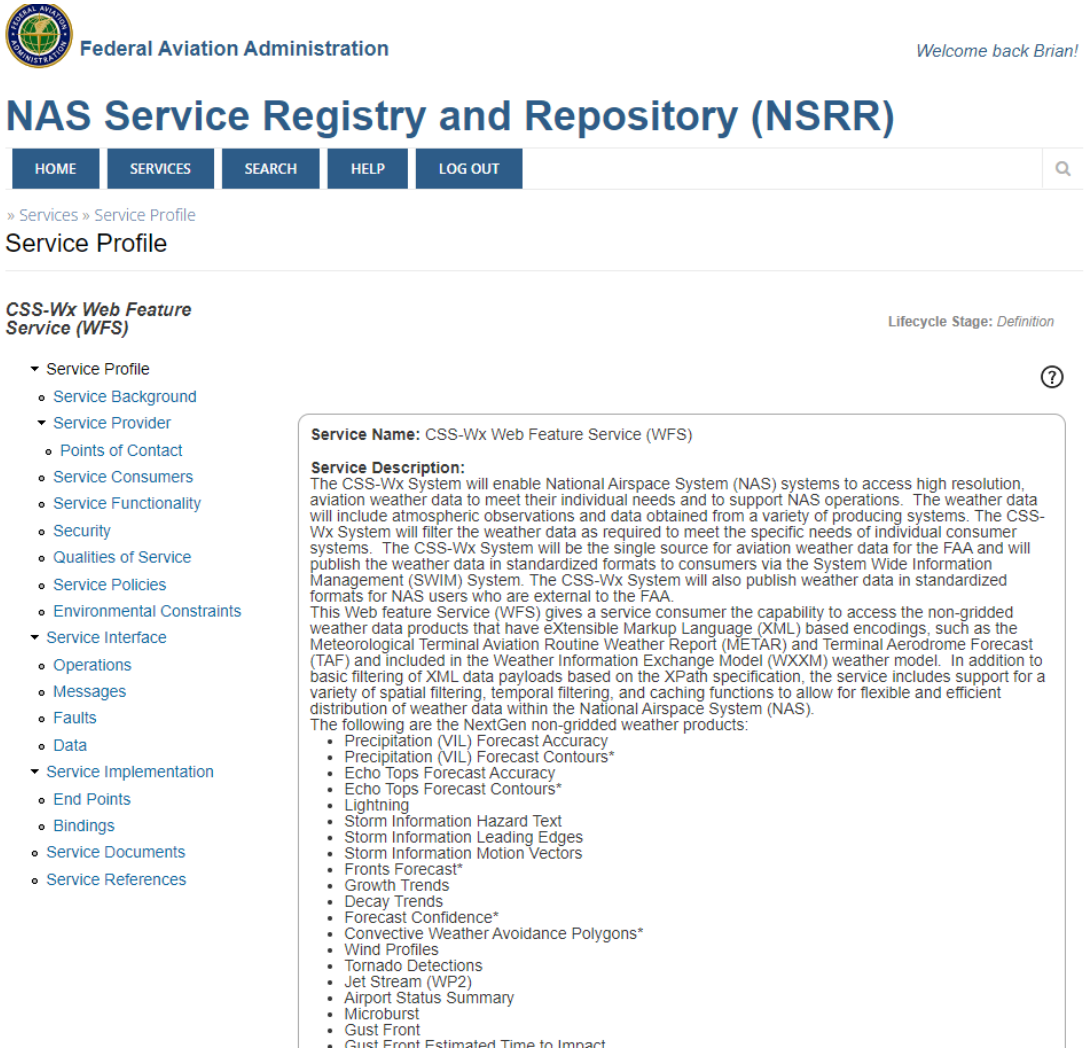
The NSRR…

- Stores descriptive information (metadata) and documents associated with a service
- Supports Governance activities throughout the service lifecycle by automatically checking for presence of metadata and artifacts required at each stage
- Notifies subscribed users of current or planned service changes

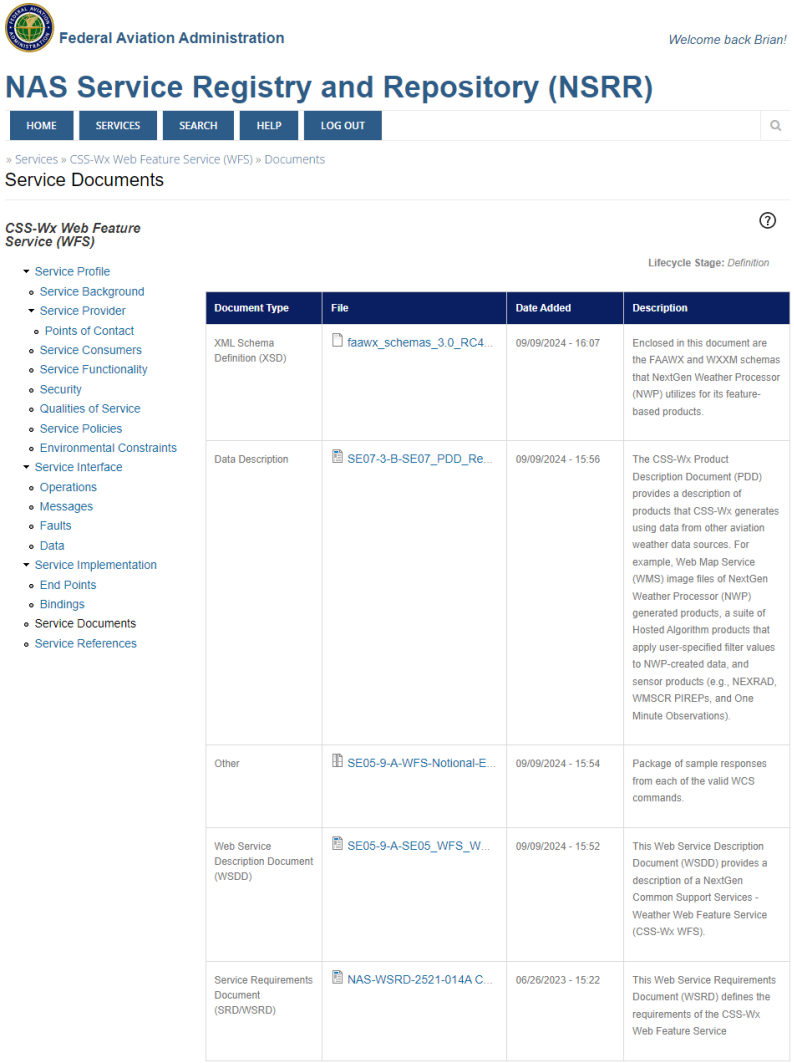
CSS-Wx on NSRR

Service Name (NSRR)	GRID (NSRR)	Service Acronym (NSRR)	Interface Type
CSS-Wx C-Node JMS Service	*Documentation to be uploaded*	CSS-Wx JMS	SOLACE JMS
CSS-Wx Web Coverage Service	https://nsrr.faa.gov/sites/default/files/css-wx-wfs/SE05_WCS_WSDD_Vol_I_RevF.docx	CSS-Wx WCS	Restful
CSS-Wx Web Feature Service	https://nsrr.faa.gov/sites/default/files/css-wx-wcs/SE05_WFS_WSDD_Vol_II_RevF.docx	CSS-Wx WFS	Restful
CSS-Wx Web Mapping Service	https://nsrr.faa.gov/sites/default/files/css-wx-wcs/SE05_WMS_WSDD_Vol_III_RevF.docx	CSS-Wx WMS	Restful

CSS-Wx on NSRR



CSS-Wx on NSRR



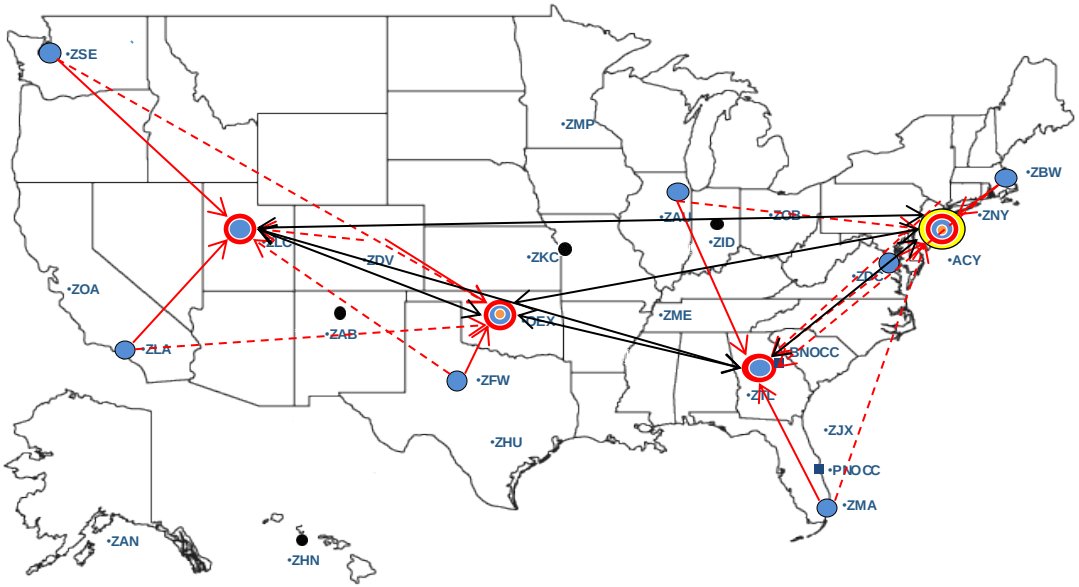
SWIM Infrastructure: NEMS and SCDS

NAS Enterprise Messaging Service

- Allows the seamless exchange of data between producers and consumers
- Enables the FAA to deliver core messaging and publishing data to consumers and other FAA programs

SWIM Cloud Distribution Service

- Publicly accessible cloud-based infrastructure
- Provides near real-time SWIM data to the public
- Non-sensitive data



SWIM Infrastructure: NEMS and SCDS

Consumer's planned data needs:

- NESG SWIM connections are reserved for industry partners that require operational data usage (e.g., airlines, vendors, etc.)
  - Users who have valid use case for sensitive flight or Collaborative Decision Making (CDM) data
  - Data otherwise not publicly available
- SWIM Cloud Distribution Service (SCDS) is for non-operational use of SWIM data (e.g., developers, data scientists, etc.)

To become a user of SWIM services/generic SWIM questions:

Email: **Data-To-Industry@faa.gov**

Required:

- Establishing an IP service connection to an FAA network security gateway; and
- Ensuring your application follows the FAA's governance policies and standards for producing/consuming SWIM data products

Data via NESG

- NESG
  - The National Airspace System (NAS) Enterprise Security Gateway (NESG) infrastructure provides a framework for compliance with boundary protection service requirements between NAS and non-NAS systems/networks in accordance with FAA Order 1370.114
  - The NESG infrastructure includes a layered security scheme to facilitate defense in depth security controls and provides a buffer between the NAS and external systems/networks to ensure no direct service connections to NAS systems

- The Federal Aviation Administration (FAA) System Wide Information Management (SWIM) system Program Office (PO) classifies SWIM users as either Internal or External to the FAA National Airspace System (NAS)
  - Internal – FAA systems that operate within the NAS on Operational Internet Protocol (OPIP) networks (e.g., FAA Telecommunications Infrastructure (FTI))
    - These users do not require approval to receive sensitive data
  - External – FAA and non-FAA systems that exist outside the NAS and OPIP
    - External FAA – FAA systems that exist outside the NAS and do not operate on OPIP networks (e.g., Mission Support, Enterprise Information Management (EIM), etc.)
    - External non-FAA – Non-FAA users/organizations that connect to SWIM through the NAS Enterprise Security Gateway (NESG) and Virtual Private Network (VPN) (e.g., airlines, vendors, contractors, universities, etc.)
    - All external users require approval to receive sensitive data

Data via NESG

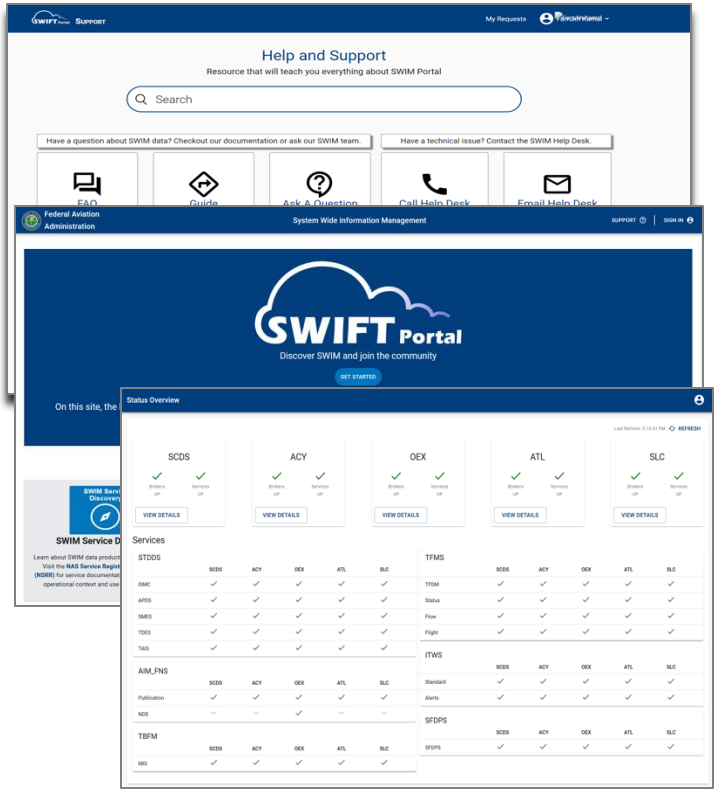
- On-Ramping of External, FAA and non-FAA consumers to the SWIM system within the NESG Untrusted domain. Work with SWIM POC to:
  - NESG covered: https://www.faa.gov/air_traffic/technology/swim/products/get_connected
  - Access agreement portal: https://aa.data.faa.gov
    - Provides list of SWIM services available for external users
  - Establish VPN connection in desired environment (R&D, virtual FNTB, FNTB, OPS)
  - Create Consumer On-Ramp form(s) to create the On-Ramp Form (ORF) to reflect the new services, queues, or subscriptions the consumer will connect to
    - Users can request carved data for publication if full data sets are not desired (via CNODE_CONSUMER domain)
  - Schedule and perform Qualification Testing for new consumers
  - Timeframes for on-ramping:
    - FNTB 3wks – month (L7 conn doc and VPN connection)
    - OPS – 3-4 months as a consumer
    - *Note these timeframes are dependent on engineer availability and backlog of pending orders*

Data via NESG

- Operational use: creating a new Operational Untrusted NEMS service connection. (Applies to new users wanting to connect to the Operational SWIM system/existing users who need an additional NEMS service connection)
  - Gather required information from the user and then place an associated order for the service
  - Various reviews are conducted to ensure compliance with FAA standards
  - Once approve, order is sent to the vendor for prioritization/implementation. The service must be ordered before any work can begin by the vendor
  - Once ordered, SWIM will work with consumers to configure network requirements (VPN to the OPS NESG /IP Supplemental form updates/coordinating with FTI Security to enable the VPN)
  - Once the VPN and OPS Services are ready, the user can request their NEMS Connection Documentation from NAS Engineering Office (NASEO) and connect to the SWIM service

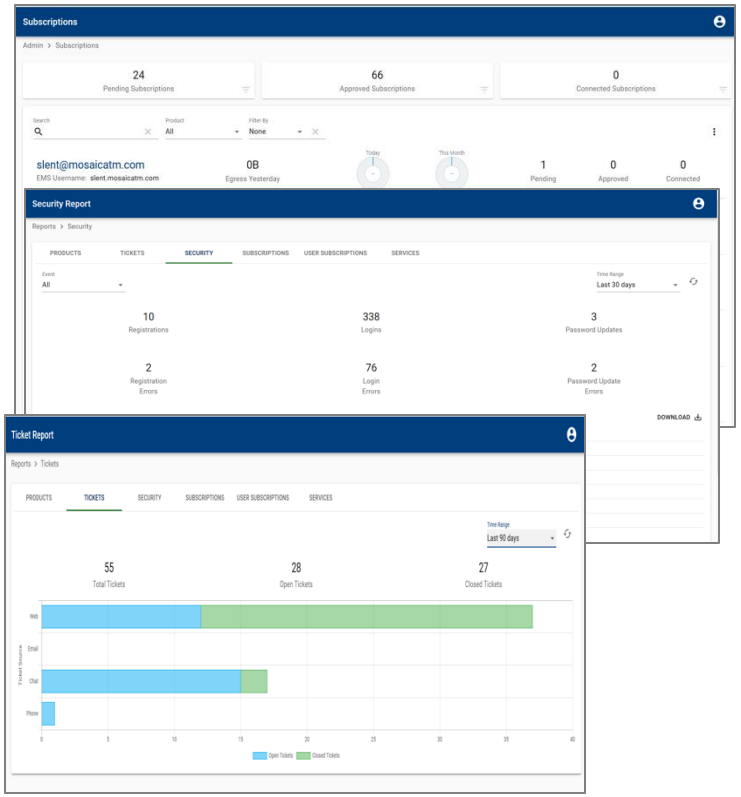
SWIFT Portal

- SWIM Cloud Distribution Service (SCDS) provides non-sensitive SWIM data to external consumers.
- SWIFT Portal adds additional functionality for users and includes the SCDS Self Service functionality



SWIFT Portal

- Update Branding
- Support Function
- Logging
- Reports
- Community Forum
- Account Management
- Service Status
- Self Service Provisioning
- News
- Security
- Research and Discovery



SWIFT Portal Experience

Help Desk Support: Dedicated Help Desk with FAQs, Ticketing and Chat functionality

Discovery: Additional information on all SWIM products and services.

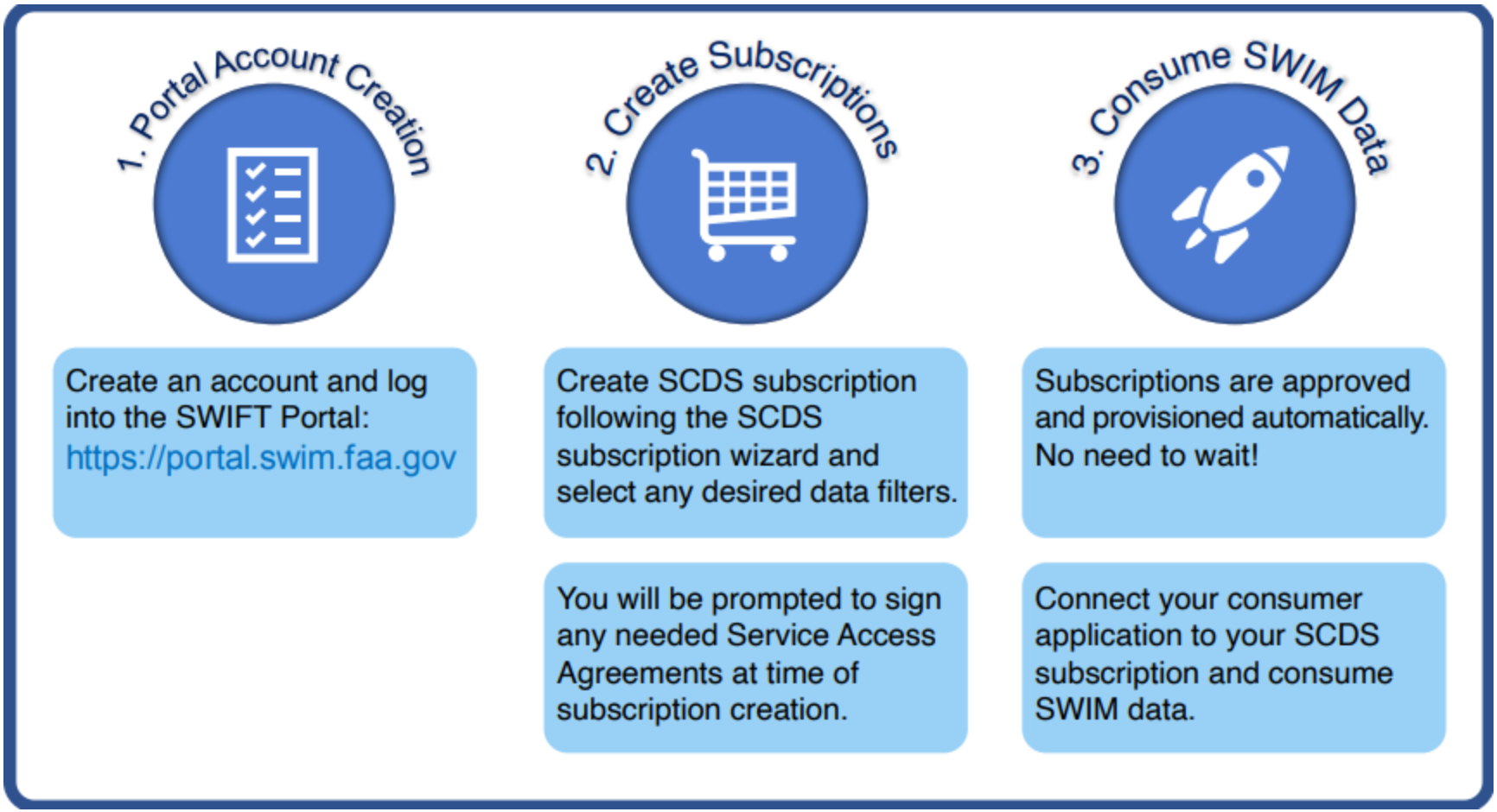
Community Forum : A place interact with members of the SWIM Community and learn more about the latest SWIM news and events.

Subscriptions: SWIM Cloud Distribution Service – Access to SWIM data

Status: Information on infrastructure and SWIM Product health status

Subscription Level Metrics: Detailed view of message rates, bandwidth and other metrics

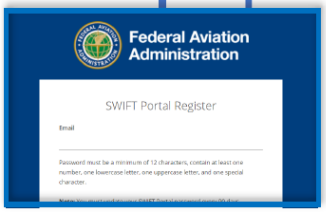
SWIFT Portal On-Boarding Process



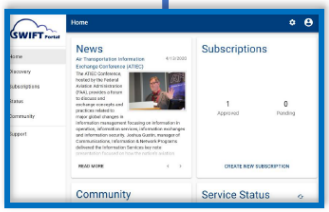
BACKUP SLIDES

SWIFT Portal
User On-Boarding Instructions

1. Portal Account Creation



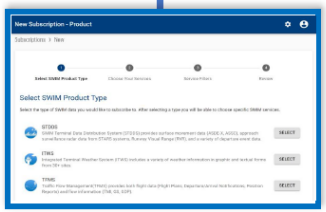
- **Create an account** https://portal.swim.faa.gov
- **Registration** Complete the form and click "REGISTER."
- **Update your account information** then click "SUBMIT."
- **Email verification** An email will be sent to the address provided on the previous page. Please validate the email address and click "SIGN IN."
- **Email confirmation** You will be taken to a page notifying you that your email has been verified. Click "Back to Application."



- **Portal Homepage** Once logged in, you will be taken to the Portal Homepage.

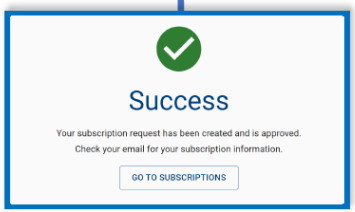
  From the Portal Homepage, you can:
  - Learn more about SWIM services on the Discovery page.
  - Create and manage your Subscriptions.
  - Check the status of SWIM Infrastructure and Services.
  - Engage in the Community forum
  - View the Support page for additional help.

2. Create Subscriptions



- **Subscriptions** To create and manage Subscriptions:
  - Select "Subscriptions" on the left menu bar
  - Select "Get Started Now"
  - Select a SWIM product type for your new subscription.
- **User Access Agreement** All users MUST sign the FAA Access Agreement to be able to consume SWIM services
- **Filters** Set up your data filters - multiple filters can be applied for a single feed.

3. Consume SWIM Data



- **Consume SWIM Data** Connect your consumer application to your approved subscription(s) and consume SWIM data.

  Note: *A sample client called the SWIM Jumpstart Kit is available for download from the SWIM website and the Portal Support Page under Guides.*

Note: The FAA recommends Chrome or Firefox when accessing Portal.

SWIM SCDS Helpdesk Contact Information
- Enterprise Control Center (ECC) Contact Information:
- 855-FAA-NEMC (855-322-6362)
- Option "3" for Enterprise Services then "1" for SWIM Services (24/7/365)
- 9-ATO-SECC-OPS@faa.gov

Please identify yourself as an SCDS/Portal user

For additional documentation and Portal Support visit: https://support.swim.faa.gov/

NEMS Messaging Capabilities

- NEMS supports two message exchange patterns (MEPS), Publish/ Subscribe and Request/ Response
- The **Publish/ Subscribe** is a MEP in which senders (Publishers) send messages to receivers (Subscribers) through Message Broker service
- Publishers have no knowledge about who Subscribers are
- Subscribers have no knowledge about who Publishers are
- Subscribers express interest in receiving only specific messages, based on a message topic
- All subscribers will receive messages published on a specific topic
- Two main advantage of the Publish/Subscribe pattern are:
  - loose coupling,
  - scalability

NEMS Messaging Capabilities, cont'd

- The **Request/Response** is a MEP in which a requestor sends a request message to a replier which receives and processes the request, ultimately returning a message in response
- This pattern allows two systems to have a two-way conversation with one another over a messaging channel
- Typically (but not always) is implemented as SOAP-based Web Service
  - NEMS provides a simple proxy capability and transports the data via HTTP from the Message Producer to the Message Consumer
- Most commonly this pattern is implemented in synchronous fashion
- Request/Response may be implemented asynchronously, with a response being returned at some unknown later time

NEMS Messaging Capabilities, cont'd

- NEMS supports **REST services** and provides **RESTful messaging** capabilities
- REST (Representation State Transfer) defines a set of architectural principles for designing Web services that focus on a system's resources
- RESTfull services is an alternative to SOAP-based Web services
- REST basis terminology:
    - **Resource** is abstraction of an entity or capability to be expose, i.e. Web pages (both static and dynamic), document Images, rich media, method/procedure/operation calls, Web services
    - **Uniform Resource Identifier (URI)** is a String that identifies a resource over a network
    - **Representation** is a concrete manifestation of a resource
    - **Hypermedia** is a style of building systems for accessing information via a network of multimedia nodes connected by hyperlinks

Consumer request for Sensitive/Restricted Data

- External FAA SWIM Consumers
  - FAA entities/programs that exist outside of NAS/OPIP may request access to sensitive/restricted data through SWIM. The requesting program must provide a justification for their need to know, or why they need access to the restricted data. The FAA program works with the Sensitive Flight Data (SFD) release team to develop justification of the sensitive data need. Once the need has been established, the program and SFD release team develop rules of business that govern how the Sensitive Unclassified Information (SUI) must be protected in accordance with FAA Order 1600.75, Protecting Sensitive Unclassified Information (SUI), and FAA Order 1370.121, Information Security and Privacy Program & Policy.
- Step-by-Step Process Description
  1. The request for sensitive/restricted data is initiated by the FAA program. The FAA program may request access to sensitive/restricted data directly through the SWIM Point of Contact (POC) or the SWIM Program Office.
  2. The SWIM POC explains the sensitive data process and requests an initial justification for the sensitive data need.
  3. The FAA program provides the initial justification to the SWIM POC.
  4. The SWIM PO forwards the program's request to the SFD release team mailbox2.
  5. The SFD release team works with the FAA program to create a justification for the sensitive data need.
  6. The SFD release teams works with the FAA program to create rules of behavior to help control the sensitive data.
  7. If the SFD release team approves the FAA program's connection proceed to step 8. If the SFD release team does not approve the FAA program's connection, return to step 5 or exit the process if the request is fully rejected.
  8. The SWIM user presents the updated EIS briefing for approval at the CINP ARB.
  9. The AODR approves changes to the SWIM user's sponsor program security documentation at the CRB.
  10. The SWIM POC receives full approval from all organizations that the FAA program may consume sensitive data.
  11. The SWIM POC will on-ramp the user's restricted/sensitive data request as usual1.
  12. The SWIM PO will periodically review all sensitive data consumers based on rules of behavior agreed to with SFD, which may include the duration of approval for short-term projects.
  13. If the FAA program is no longer approved to consume sensitive data, the SWIM POC will disconnect the FAA program

Consumer request for Sensitive/Restricted Data

- External non-FAA SWIM Consumers
  - Non-Government, non-FAA Entities, and External Organizations may request access to sensitive/restricted data through SWIM. The requesting user must have an active contract with the FAA and provide a justification for their need to know, or why they need access to the restricted data. Once the need for sensitive data has been established the requesting user, FAA Sponsor, and NAS Data Release Board (NDRB) enter a legal agreement to address data protection and control of SUI in accordance with FAA Order 1200.22, External Requests for National Airspace System (NAS) Data, FAA Order 1600.75, Protecting Sensitive Unclassified Information (SUI), and FAA Order 1370.121, Information Security and Privacy Program & Policy. Once the legal agreement is signed by all parties, the CINP ARB reviews and approves the EIS changes. The ISSO updates all necessary security documentation and presents the SAB to the CRB.
  - The requesting user must work with their respective FAA Sponsor (e.g., Contracting Officer (CO), NAS Defense Program (NDP)) for final approval. The FAA Sponsor is the only individual who may authorize the release of restricted data to the requesting user. The requesting user should provide the following to their FAA Sponsor to justify their request: establish their need to know, their duty to protect the data, and how the data will be terminated once the contract or need for sensitive data ends. If the requesting user's active contract/agreement does not contain the necessary security clause, then they will need to work with the FAA Sponsor to create a contract/agreement modification that establishes the justifications mentioned. Once the requesting user acquires authorized approval from their FAA Sponsor, they should notify their SWIM POC to proceed with on-ramping as usual
- Step-by-Step Process Description
  1. The request for sensitive/restricted data is initiated by the SWIM user. The SWIM user may request access to sensitive/restricted data directly through the SWIM POC or the SWIM PO.
  2. The SWIM POC explains the sensitive data process and requests an initial justification for the sensitive data need.
  3. The SWIM user provides the initial justification to the SWIM POC.
  4. The SWIM PO forwards the SWIM user's request and initial justification to the NDRB mailbox.
  5. The NDRB works with the SWIM user and FAA Sponsor to refine the justification for the sensitive data need.
  6. The NDRB will tentatively approve justification if it is valid. If the justification is rejected, return to step 5 so it maybe reworked with the FAA Sponsor. If the request is rejected outright, exit the process.
  7. The NDRB will work with the SWIM user and the FAA Sponsor to enter into a legal agreement3 to control the sensitive data.

Consumer request for Sensitive/Restricted Data

- Step-by-Step Process Description cont.
  8. The SWIM user presents the updated EIS briefing for approval at the CINP ARB.
  9. The AODR approves changes to the SWIM user's sponsor program security documentation at the CRB
  10. Final approval of sensitive data requests may only be approved and authorized by the requesting SWIM user's FAA Sponsor:
      a. The requesting user must have an active contract containing the security clause for handling sensitive/unclassified information. If the user does not already have the security clause in their active contract, they will work with their FAA Sponsor to create a contract modification so it can be included.
      b. If the requesting user's active contract already contains the security clause, then they should work with their FAA Sponsor to address the security clause, justify their need to know, and their duty to protect and maintain the sensitivity of the data. The FAA Sponsor is the only one with authority to authorize the release and receiving of sensitive/restricted data.
  11. Once the requesting user has obtained approval from their FAA Sponsor, the requestor will send a letter to the SWIM POC authorizing the release.
  12. After the requestor provides FAA Sponsor approval and authorization, the SWIM POC will on-ramp the user's restricted/sensitive data request as usual1.
  13. The SWIM PO will periodically review all sensitive data consumers based on rules of behavior agreed to with SFD, which may include the duration of approval for short-term projects.
  14. If the SWIM user is no longer approved to consume sensitive data, the SWIM POC will disconnect the SWIM user.