# How to Download, Install, and Run Consent2Share

## SAMHSA's Open Source Data Segmentation and Consent Management Application

April 25, 2018
1:00 p.m. – 2:30 p.m.

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Substance Abuse and Mental Health Services Administration

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# Introduction to Consent2Share

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Substance Abuse and Mental health Services
Health Information Team

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# Section One:

# Introduction to Consent2Share

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# Health IT Strategic Initiative

## Leading Change 2.0:
## Advancing the Behavioral Health of the Nation
## 2015–2018

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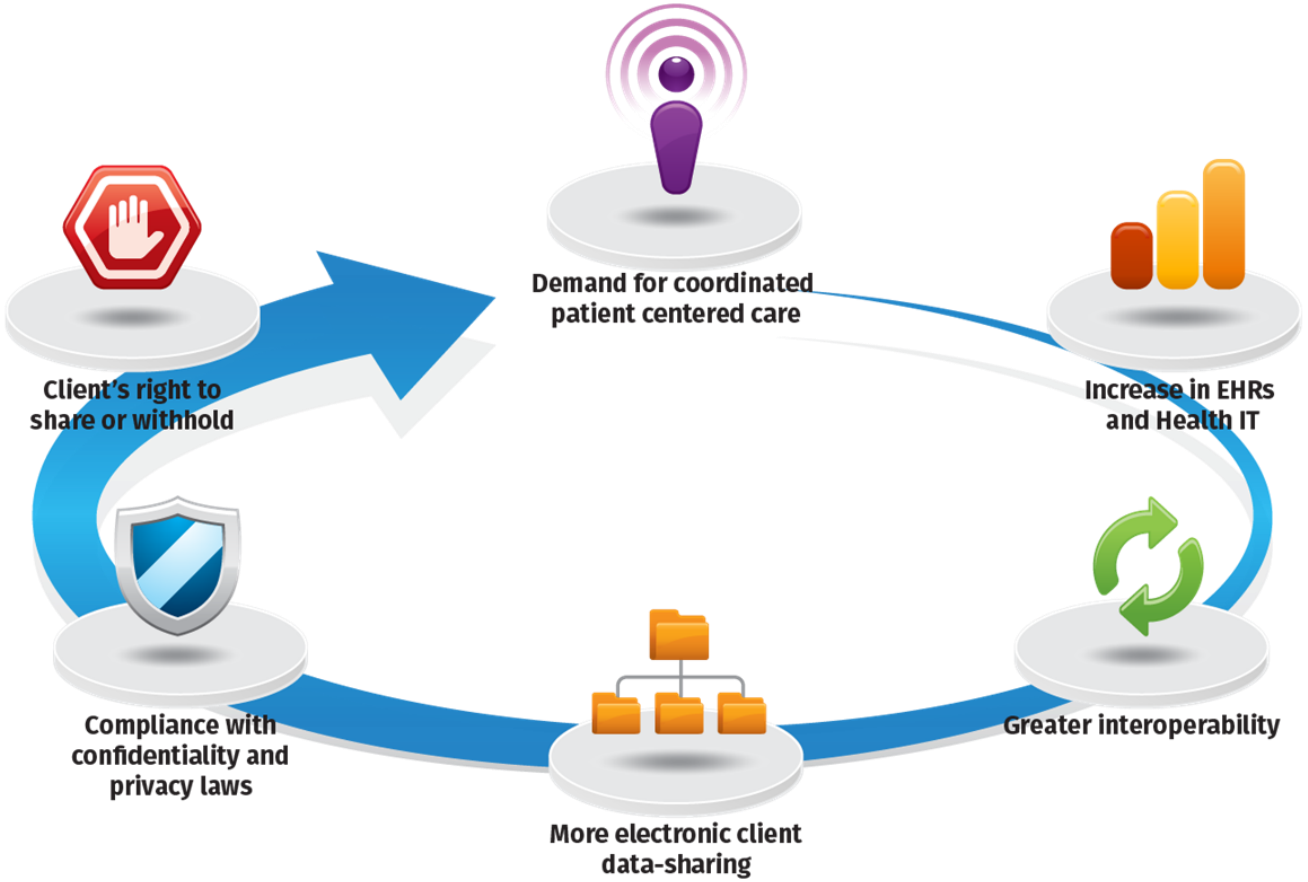
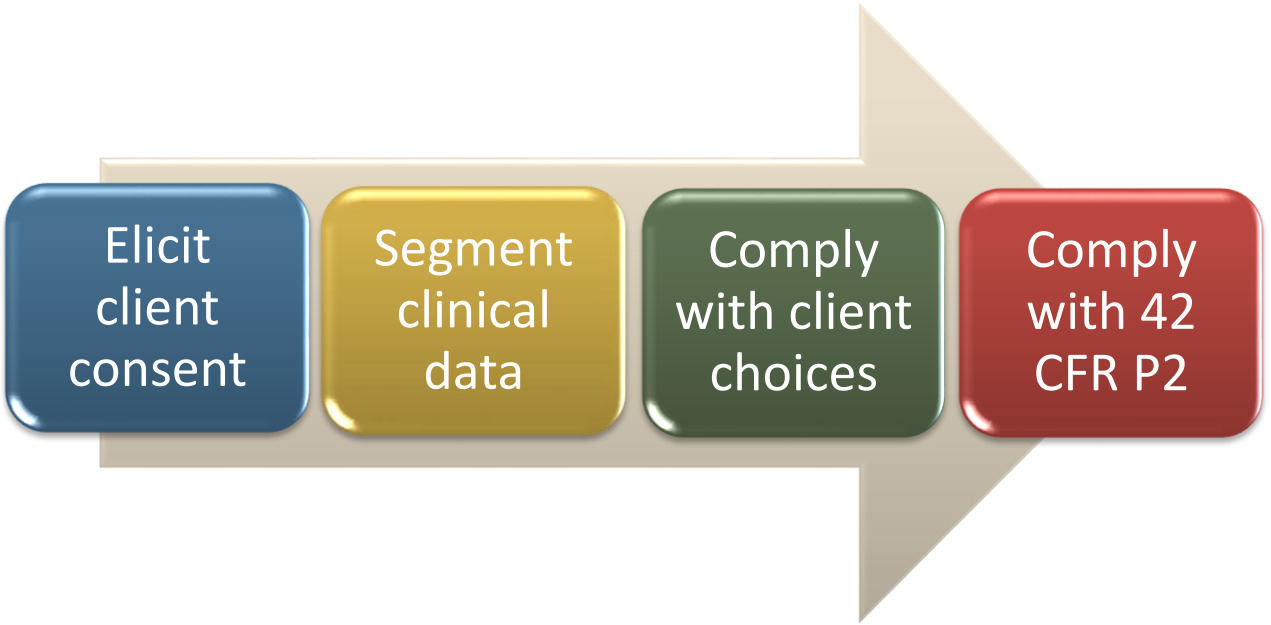
# The Current Health Care Environment



# Need for Data Segmentation & Consent Management



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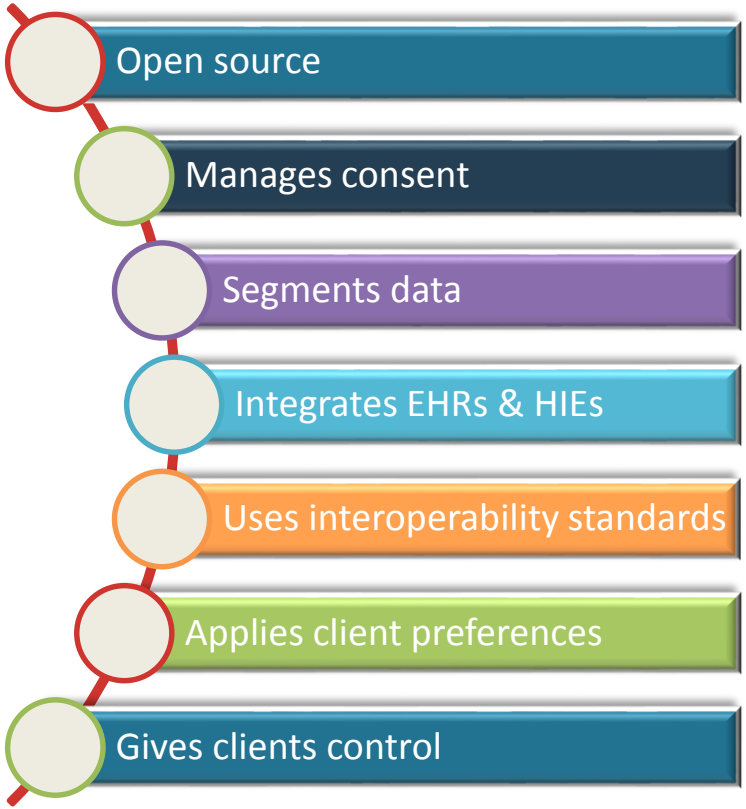
# Solution: Consent2Share

consent2share



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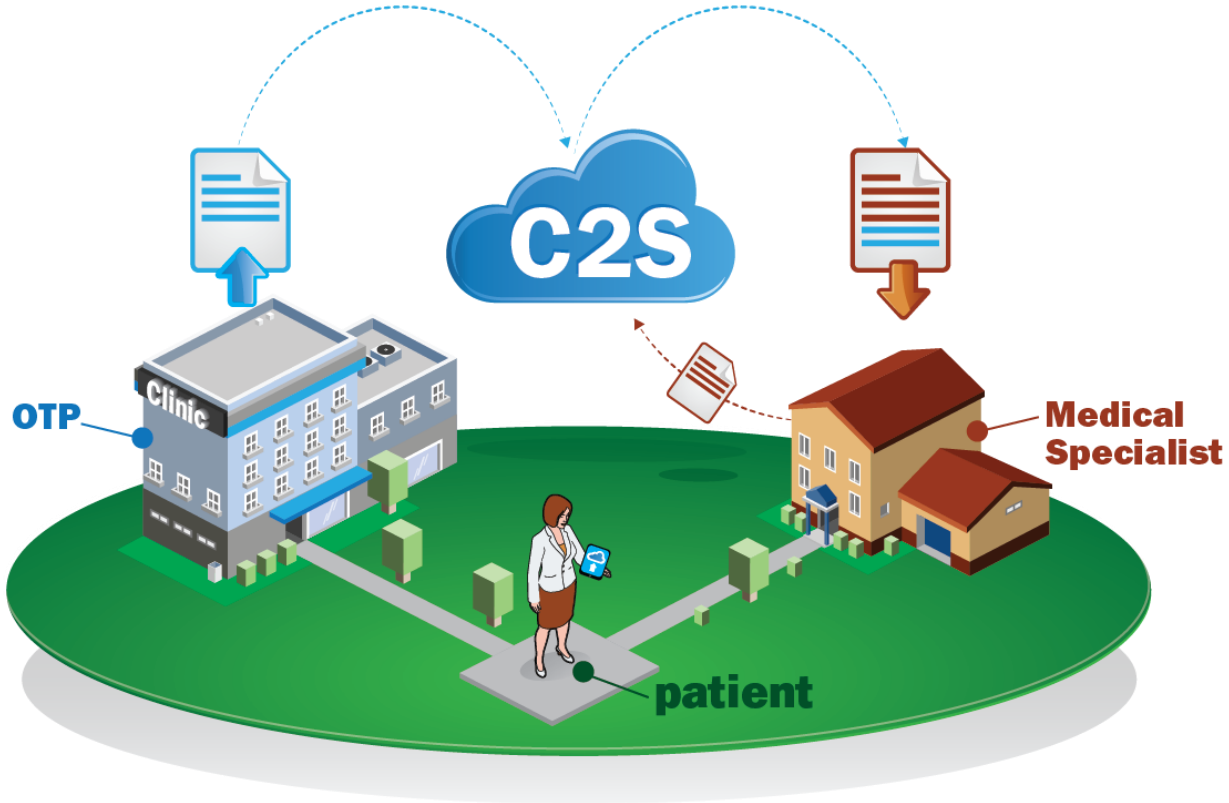
# Client Controls Information Exchange



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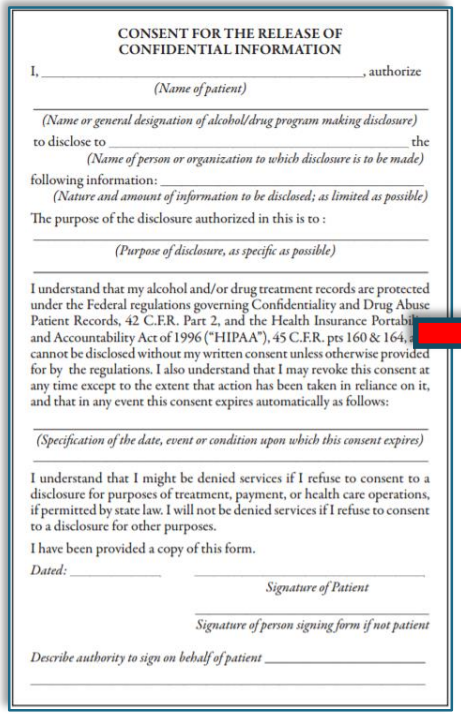
# Consent2Share: Patient Provides Electronic Consent



**CONSENT FOR THE RELEASE OF CONFIDENTIAL INFORMATION**

I, _____, authorize
*(Name of patient)*

_____
*(Name or general designation of alcohol/drug program making disclosure)*

to disclose to _____ the
*(Name of person or organization to which disclosure is to be made)*

following information: _____
*(Nature and amount of information to be disclosed; as limited as possible)*

The purpose of the disclosure authorized in this is to :

_____
*(Purpose of disclosure, as specific as possible)*

I understand that my alcohol and/or drug treatment records are protected under the Federal regulations governing Confidentiality and Drug Abuse Patient Records, 42 C.F.R. Part 2, and the Health Insurance Portabil and Accountability Act of 1996 ("HIPAA"), 45 C.F.R. pts 160 & 164, cannot be disclosed without my written consent unless otherwise provided for by the regulations. I also understand that I may revoke this consent at any time except to the extent that action has been taken in reliance on it, and that in any event this consent expires automatically as follows:

_____
*(Specification of the date, event or condition upon which this consent expires)*

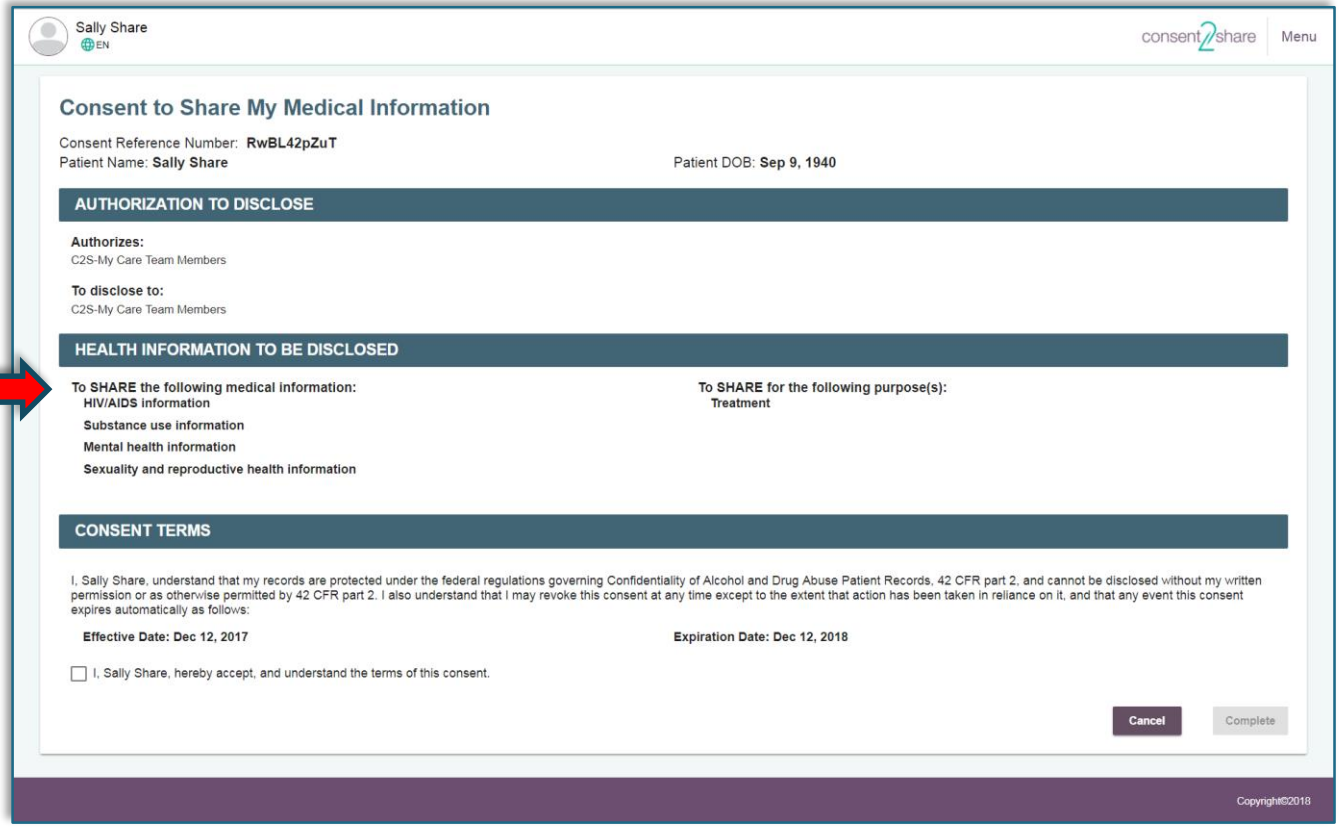
I understand that I might be denied services if I refuse to consent to a disclosure for purposes of treatment, payment, or health care operations, if permitted by state law. I will not be denied services if I refuse to consent to a disclosure for other purposes.

I have been provided a copy of this form.

*Dated:* _____ _____
*Signature of Patient*

_____
*Signature of person signing form if not patient*

*Describe authority to sign on behalf of patient* _____



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# Architecture, Considerations, and Obtaining

Stan Peabody
Software
Tester
FEI Systems

Burçak Uluğ
Sr. Application Developer
FEI Systems



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# Section Two:

# Overview of Consent2Share Architecture

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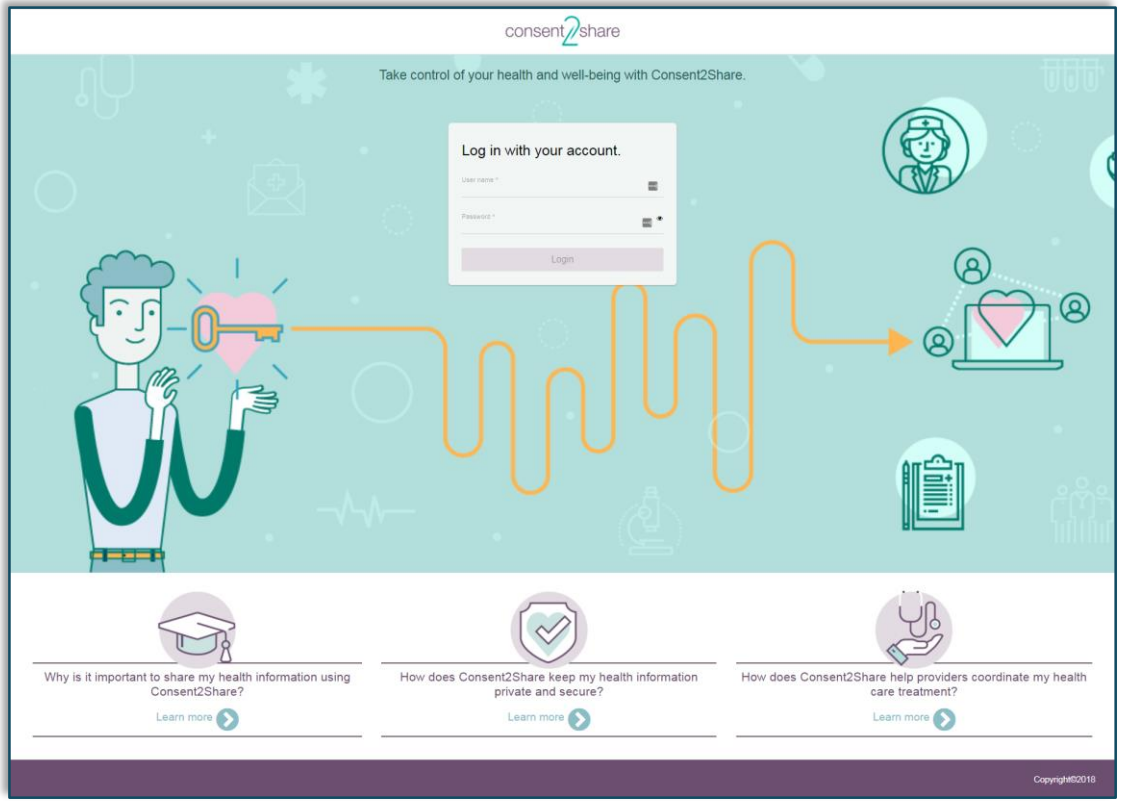
# Technical Benefits of Consent2Share

- Open-source web application
- Web-based user interface for consent management and data segmentation
- Enables data redaction, data segmentation, and patient-driven consent preferences



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# Technical Benefits of Consent2Share, Continued

- Includes value set management
- Integrates with existing EHR and HIE systems
- Uses interoperability standards
- Complies with DS4P, Section 508, HL7, 42 CFR Part 2, HIPAA
- Supports behavioral health data integration with Fast Healthcare Interoperability Resources (FHIR) Servers

HL7® FHIR®



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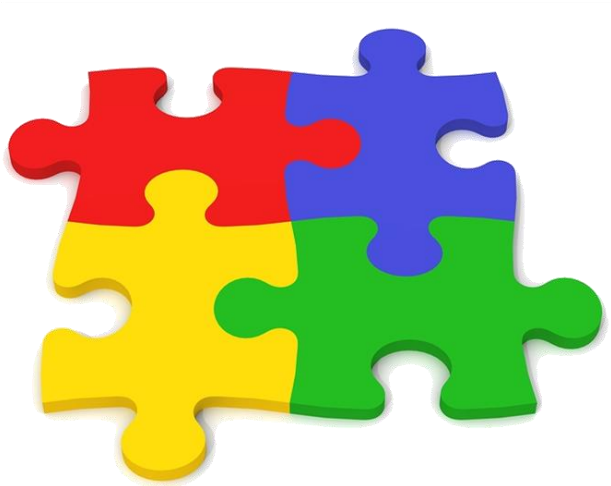
# Technical Benefits: A Component Approach

- Consent2Share consists of discrete components
- One component is separate from another component
- Modular approach allows greater customization



# Two Consent2Share Editions

| Consent2Share HIE Edition | Consent2Share Manual Edition |
| --- | --- |
| • Integrates with HIE systems | • Does not require HIE<br>• Works with low-tech workflow (phone/FAX)<br>• Providers manually upload/download records<br>• Nominal impact to workflow and integration |

- Two Editions
- Same code base
- Meets providers where they are
- Aligns with providers' resources and capabilities

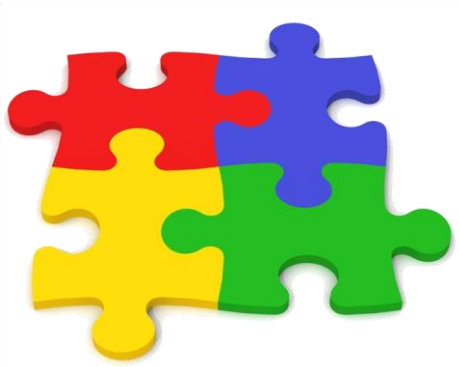
# Technical Overview: Technology Stack

- Angular JS
- Angular Material
- Angular CLI
- Node.js
- NPM
- MD2
- RXJS
- TypeScript
- JavaScript - ES6
- HTML5
- CSS3
- Oracle Java 8
- Spring Framework
- Spring Boot
- Spring Cloud
- Apache Maven
- Apache Tomcat
- MySQL
- Flyway
- Docker and Docker Compose
- Cloud Foundry UAA Server

# Technical Overview: Architecture

- Employs a Microservices architecture
  - ✓ Highly scalable
  - ✓ Flexible
  - ✓ Resilient
- Consent2Share Components:
  - ✓ User Interfaces
  - ✓ Microservices
  - ✓ Supporting Infrastructure Services
  - ✓ Third-party Services

- Spring Boot
- Spring Cloud
  - ✓Spring Cloud Netflix
  - ✓Spring Cloud Security



# Technical Overview: Four User Interfaces

| | |
|---|---|
| Patient UI | For patients to review and manage their consents |
| Provider UI | For providers to create and manage patient accounts |
| Staff UI | An admin UI to create and manage user accounts |
| Master UI | A single UI to login as patient, provider, or staff |

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# Technical Overview: Microservices

- Master UI API
- Patient UI API
- Provider UI API
- Staff UI API
- User Management Service
- FHIR Integration Service
- Provider Lookup Service
- Policy Enforcement Point Service
- Context Handler
- Patient Consent Management Service
- Patient Health Record Service
- Try My Policy
- Document Segmentation Service
- Document Validator Service
- Value Set Service

# Technical Overview: Microservices

| | |
|---|---|
| Patient UI API | Backend For Frontend components |
| Provider UI API | |
| Staff UI API | |
| Master UI API | |

# Technical Overview: Microservices

| | |
|---|---|
| User Management Services | • User account creation process<br>• User account activation<br>• User disable<br>• User update<br>• User demographics persisting |
| FHIR Integration Services | • Spring Boot project<br>• Provides RESTful endpoints<br>• Allows applications to publish and retrieve FHIR resources |
| Provider Lookup Services | • Stores provider information as a provider directory<br>• Provides a RESTful service for querying providers<br>• Uses query parameters:<br>✓ First name, last name, gender, address, and phone for providers<br>✓ Organization name, address, and phone for organizational providers |

# Technical Overview: Microservices

| | |
|---|---|
| Policy Enforcement Point Service | • Delegates the access decision to the Context Handler API<br>• Uses the Document Segmentation Service for segmenting CCD documents |
| Context Handler | • Makes PERMIT/DENY access decisions based on request contexts<br>• Uses Policy Decision Point to evaluate requests against authorization policies |
| Patient Consent Management Service | Provides APIs for patients to manage their electronic consents including:<br>✓ Create consent<br>✓ Edit consent<br>✓ Delete consent<br>✓ Consent eSignature<br>✓ Manage patient provider list |

# Technical Overview: Microservices

| | |
|---|---|
| Patient Health Record Service | • Manages and retains information about each patient<br>• Manages C32 and/or C-CDA documents that patients have uploaded to test their consents using TryMyPolicy |
| Try My Policy | • Enables patients to preview a redacted version of their health record |
| Document Segmentation Service | • Segments patients' sensitive health information<br>• Uses the privacy settings selected in the patient's consent |

# Technical Overview: Microservices

| | |
|---|---|
| Document Validator Service | • Validates C32, C-CDA R1.1 and C-CDA R2.1 clinical documents<br>• RESTful Web Service wrapper around Model Driven Health Tools libraries<br>✓ Does schema validation for C32<br>✓ Does schema and schematron validation for C-CDA<br>✓ Returns the validation results from MDHT in the response<br>• Used directly by the Document Segmentation Service to validate the document before and after the segmentation |
| Value Set Service | • Manages sensitive categories, code systems, value sets, and etc.<br>• Provides RESTful service to map coded concepts to sensitive categories<br>• Provides the list of all sensitive categories available in the system |

# Technical Overview: Supporting Infrastructure Services

| | |
|---|---|
| Configuration Server | Provides support for externalized configuration, including:<br>✓ Consent2Share UI and UI API<br>✓ Edge Server<br>✓ Patient Consent Management Service<br>✓ Provider Lookup Service<br>✓ Value Set Service |
| Discovery Server | • Facilitates microservices to dynamically discover each other<br>• Promotes scalability<br>✓ Provides registry of Consent2Share service instances<br>✓ Provides a means for service instances to register, de-register, and query instances with the registry<br>✓ Provides registry propagation to other microservice (Eureka client) and Discovery Server (Eureka server cluster) instances |
| Edge Server | • Serves as gatekeeper to the outside world<br>• Keeps unauthorized external requests from passing through<br>• Uses Spring Cloud Zuul as a routing framework |

# Technical Overview: Third-party Services

| | |
|---|---|
| Cloud Foundry User Account and Authentication Server | For authentication, authorization, issuing tokens for client applications, and user account management<br><br>Implements OAuth2, OpenID Connect, JSON Web Token (JWT), and SCIM specifications |
| JBoss Drools Guvnor | A user interface and a versioned repository for business rules used by the Business Rule Management System |
| HL7 Application Programming Interface (HAPI) FHIR | A Java API for HL7 FHIR clients and servers |

# Section Three:

# Technical and Organizational Considerations

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# Technical Specifications

- Linux or Windows
- Supports Java and other open source technologies
- Uses standard API technologies
- Capable of sending and receiving Continuity of Care Documents, including C-CDAs
- Can integrate with FHIR servers and/or IHE profiles

# Technical Functionalities

- Integrate third-party solutions with HIEs, EHRs, or FHIR
  - ✓ To support interoperable health record use in accordance with federal and state laws
- Provide data exchanges that conform to relevant standards
  - ✓ DS4P, HL7 Standards, etc.
- Provide Virtual Private Network for remote connectivity
  - ✓ E.g., between Consent2Share and HIE

# Organizational Specifications

- SMEs to evaluate value sets that are linked to Consent2Share sensitive categories
- Staff to finalize the definitions of sensitive data value sets from standard medical terminologies
- Process for developing new policies, procedures, and workflows for capturing patient consent that complies with state and federal laws
- Staff to teach patients how to use Consent2Share
- Patients need computers and email addresses to manage consents

# Other Considerations

- Identify the necessary stakeholders
  - ✓ HIE, HIE technology vendor, provider organizations, EHR vendors, etc.
- Assess initial infrastructure and long-term maintenance costs
  - ✓ Technical, operational, marketing, legal, etc.
- Consider incorporating Consent2Share into existing clinical workflows
- Provide patient training and develop patient materials:
  - ✓ Value of consent management
  - ✓ How to use the system
  - ✓ How it protects privacy and security
- Patients need access to computers or tablets

# Section Four: Obtaining Consent2Share

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# Consent2Share Project Websites

**GitHub Project Site: https://bhits.github.io/consent2share/**

**GitHub Umbrella Repository**

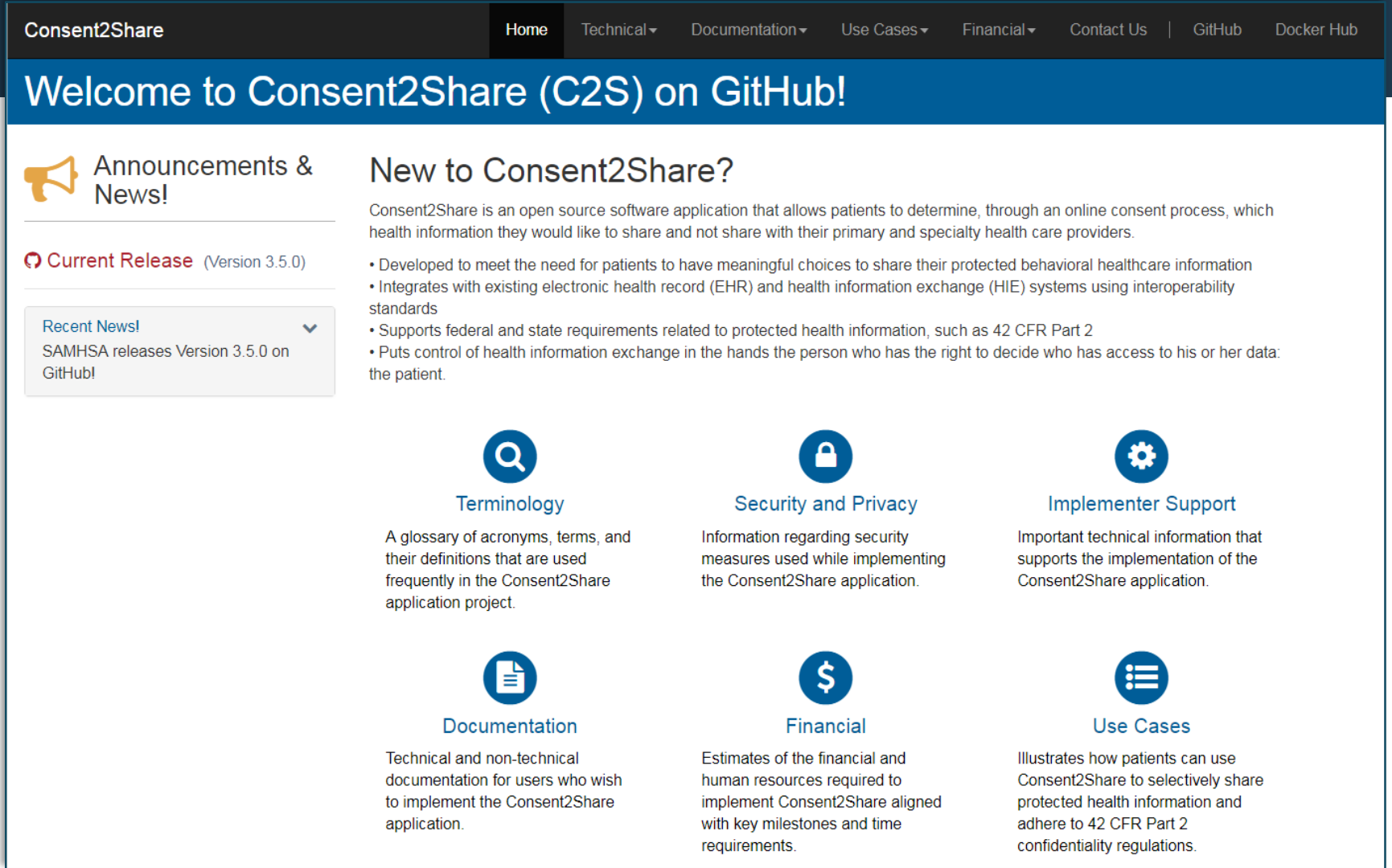
- https://github.com/bhits/consent2share
  - ✓ Releases and links to microservice repositories
  - ✓ Documentation (development and deployment guides, etc.)

**GitHub README Files**

- https://github.com/bhits/{microservice-repo}#readme

**DockerHub**

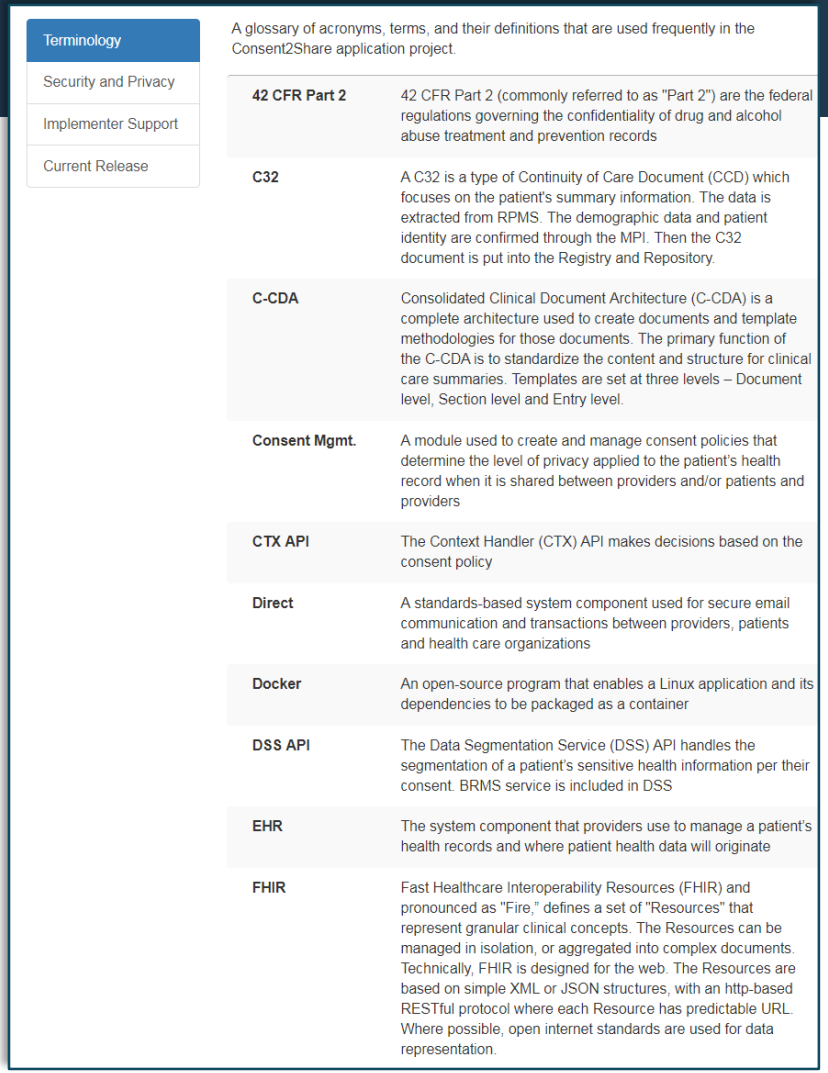
- https://hub.docker.com/u/bhits/


Consent2Share
Home
Technical
Documentation
Use Cases
Financial
Contact Us
GitHub
Docker Hub
Welcome to Consent2Share (C2S) on GitHub!
Announcements & News!
Current Release (Version 3.5.0)
Recent News!
SAMHSA releases Version 3.5.0 on GitHub!
New to Consent2Share?
Consent2Share is an open source software application that allows patients to determine, through an online consent process, which health information they would like to share and not share with their primary and specialty health care providers.
• Developed to meet the need for patients to have meaningful choices to share their protected behavioral healthcare information
• Integrates with existing electronic health record (EHR) and health information exchange (HIE) systems using interoperability standards
• Supports federal and state requirements related to protected health information, such as 42 CFR Part 2
• Puts control of health information exchange in the hands the person who has the right to decide who has access to his or her data: the patient.
Terminology
A glossary of acronyms, terms, and their definitions that are used frequently in the Consent2Share application project.
Security and Privacy
Information regarding security measures used while implementing the Consent2Share application.
Implementer Support
Important technical information that supports the implementation of the Consent2Share application.
Documentation
Technical and non-technical documentation for users who wish to implement the Consent2Share application.
Financial
Estimates of the financial and human resources required to implement Consent2Share aligned with key milestones and time requirements.
Use Cases
Illustrates how patients can use Consent2Share to selectively share protected health information and adhere to 42 CFR Part 2 confidentiality regulations.

# Terminology Page

## Terminology

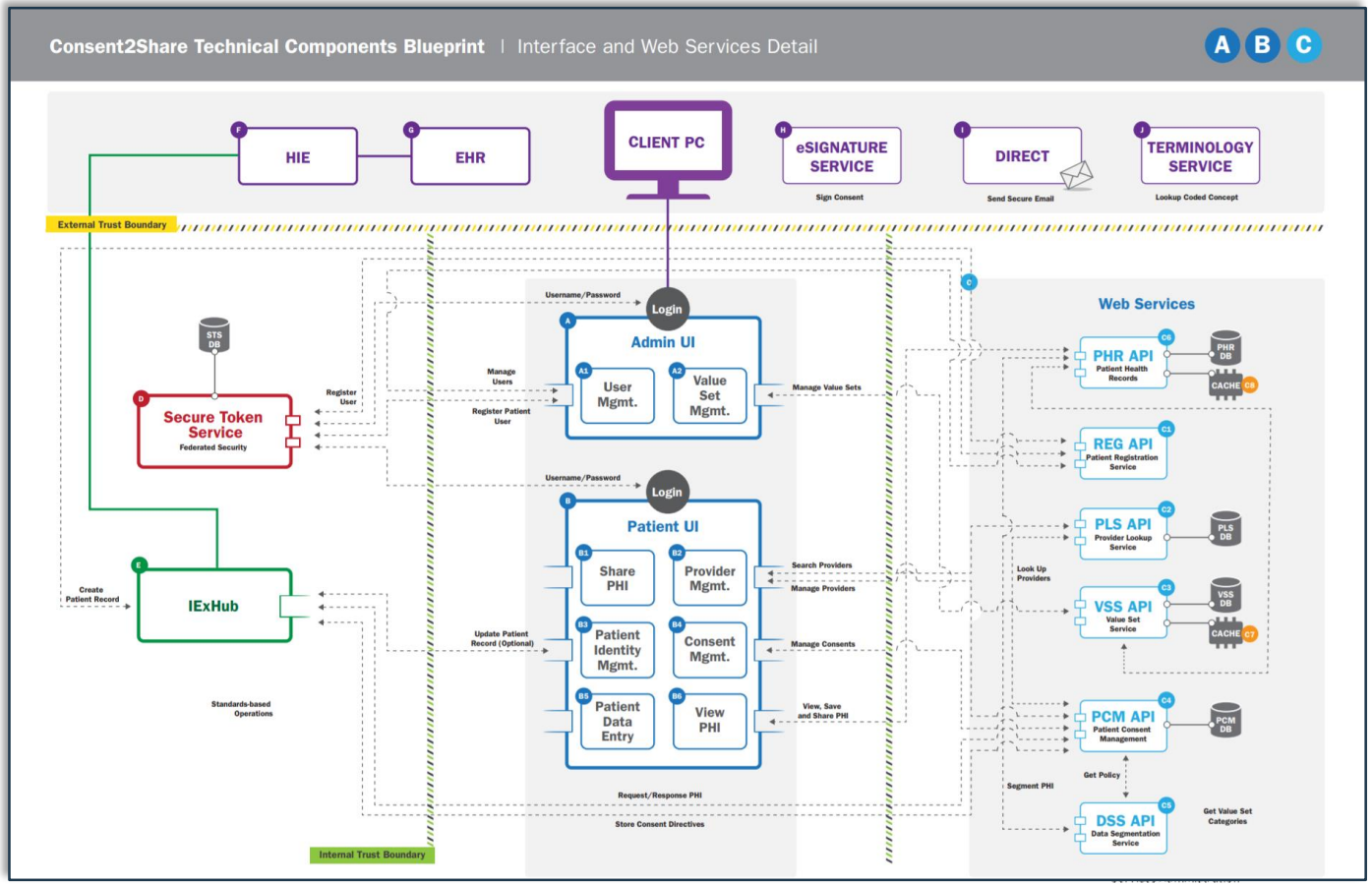
A glossary of acronyms, terms, and their definitions that are used frequently in the Consent2Share application project



# Security and Privacy Page

## Security and Privacy

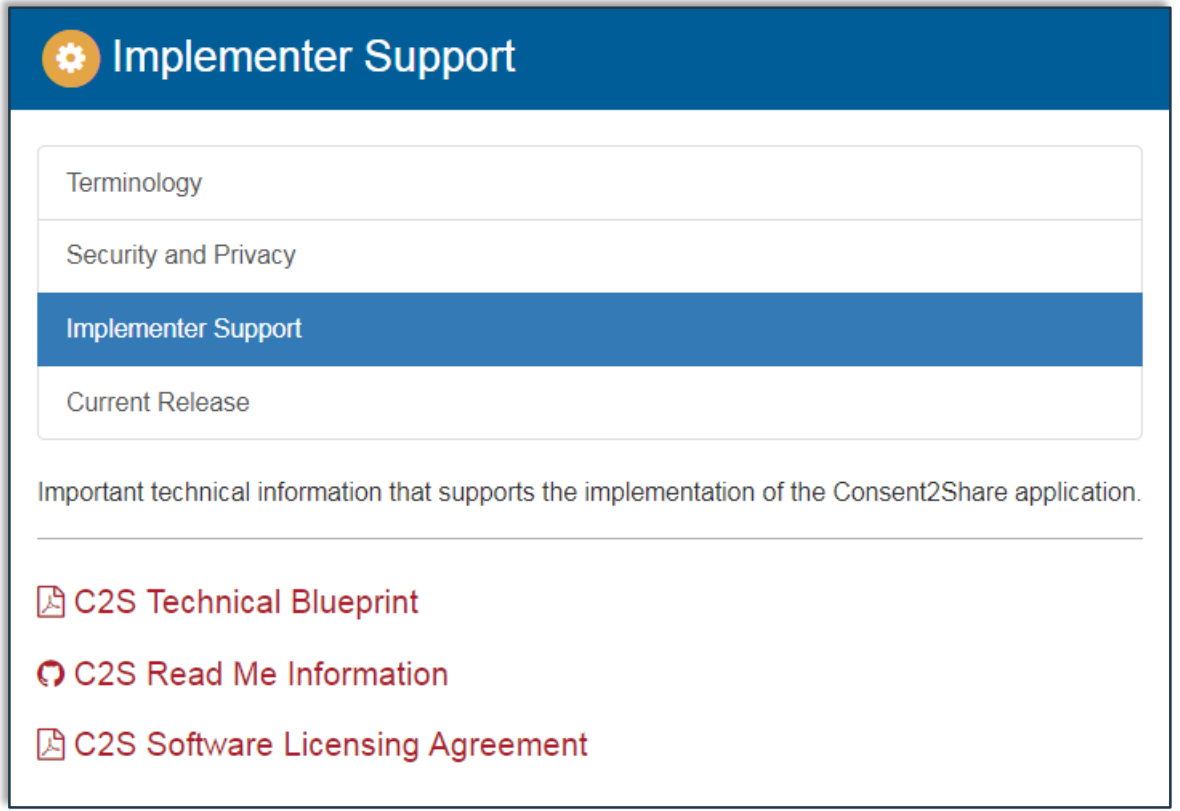
Information regarding security measures used while implementing the Consent2Share application



# Implementer Support Page

**Implementer Support**

Important technical information that supports the implementation of the Consent2Share application



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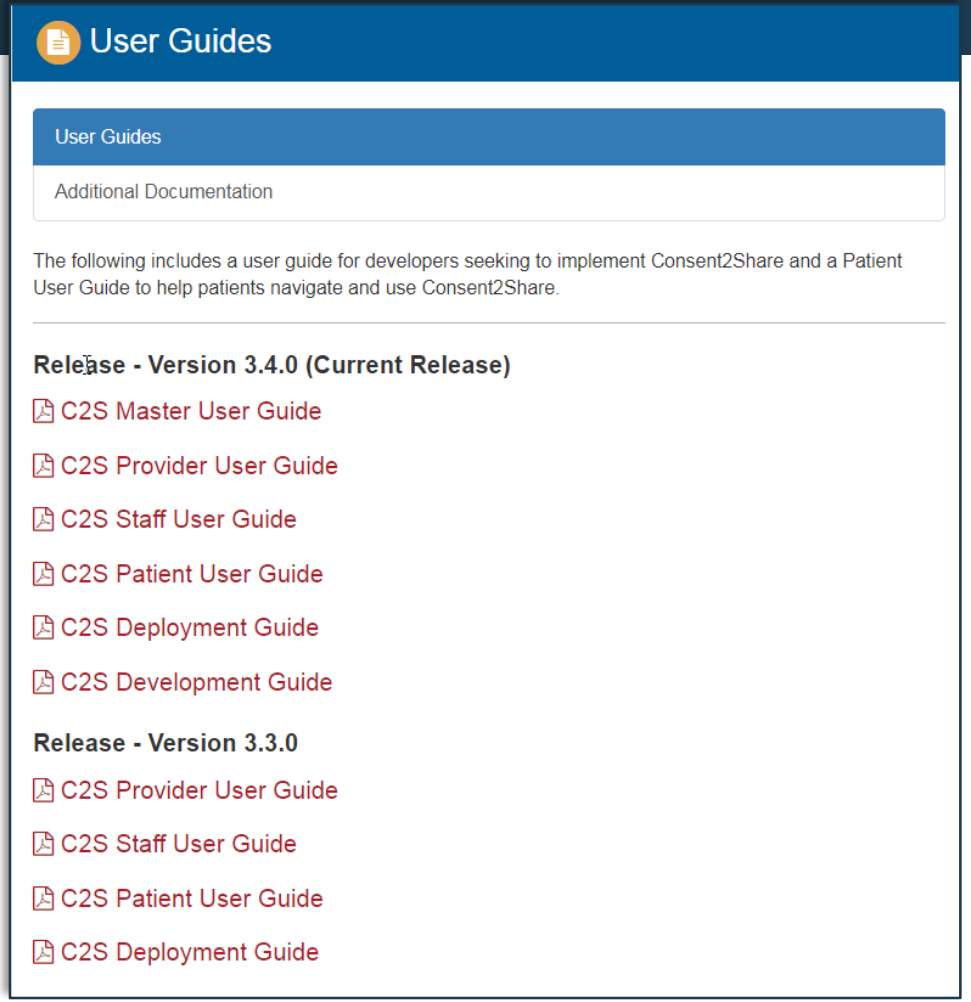
# Documentation Page

**Documentation**

Technical and non-technical documentation for users who wish to implement Consent2Share



# Financial Page

**Financial**

Estimates of the financial and technical resources required to implement Consent2Share aligned with key milestones and time requirements

Consent2Share Sample Project Plan

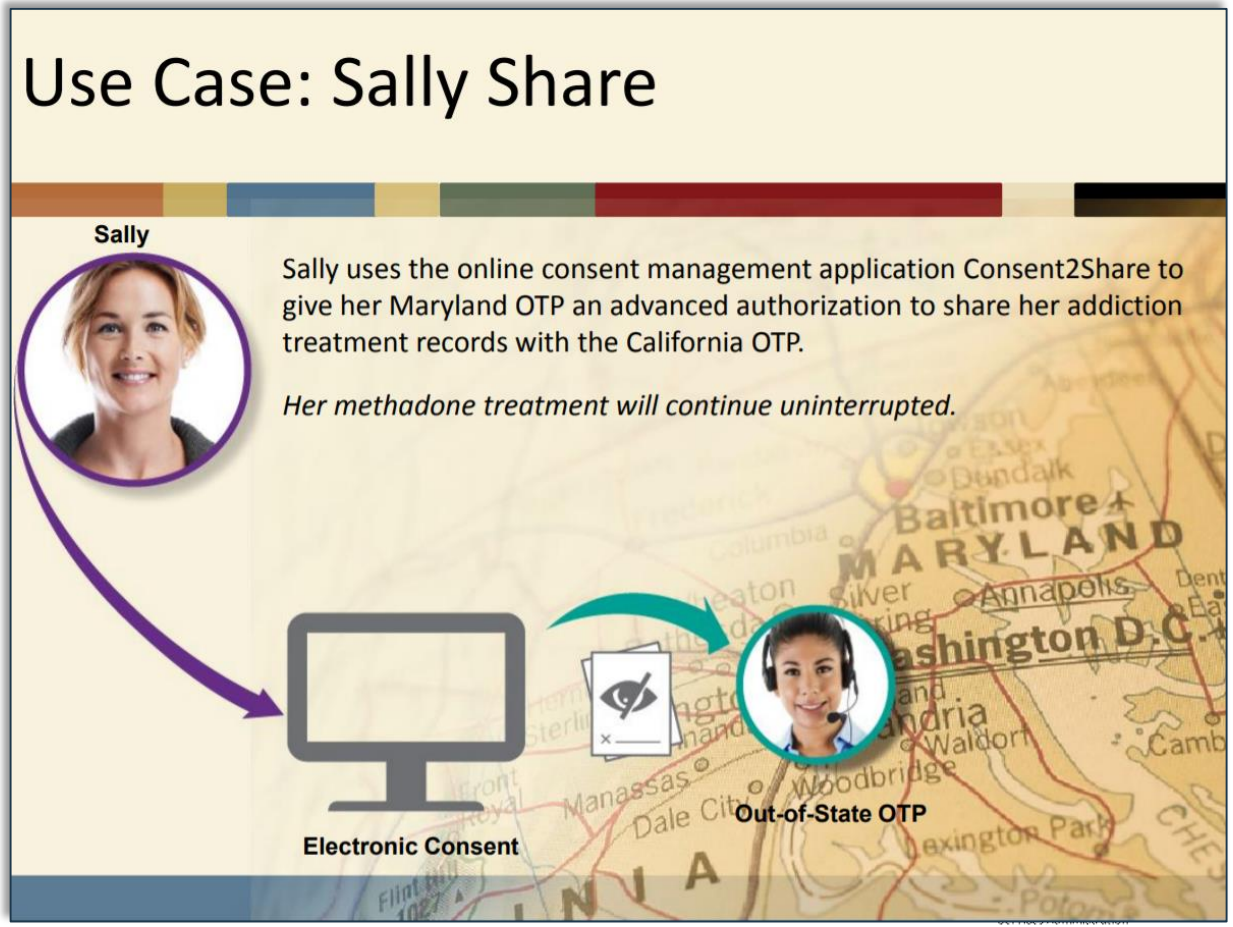
| Milestone | Description | Months Of Duration | Estimated Cost | Comments |
|---|---|---|---|---|
| 1 | Stakeholder Education, Standards, and Approach | 1 | 25K | Should be done as part of overall implementation plan |
| 2 | Implementation Plan Development | 1 | 25K | Should be done when designing stakeholder education |
| 3 | Patient Identification Integration | 2-4 | 100K | This is work to integrate Consent2Share to the EHR/HIE |
| 4 | Patient Registration Enhancements | 1 | 15K | This is work required to make small modifications to patient registration based on patient identification integration work |
| 5 | Deployment of Consent2Share micro services (API) applications | 6-9 | 400k | This work is the deployment of the Consent2Share application inclusive of IExHub |
| 6 | Finalize Consent2Share Value Set Extensions | 2-4 | 25K | This work is to finalize the Consent2Share value sets stored in Value Set Authority Center (VSAC) |
| 7 | Prepare Education Materials, Programs, and Baseline Patient Workflow | 1-3 | 25K | This work is to put together education materials for new users of Consent2Share. This is the outcome of milestone 1 |
| 8 | OTP Patient Data Sharing Implementation | 1-3 (per practice) | 10k (per practice) | This work is associated with working to connect behavioral health facilities to EHR/HIEs |

Note: This project plan is provided as a general guide but may not be reflective of an installation at your specific facility/environment.

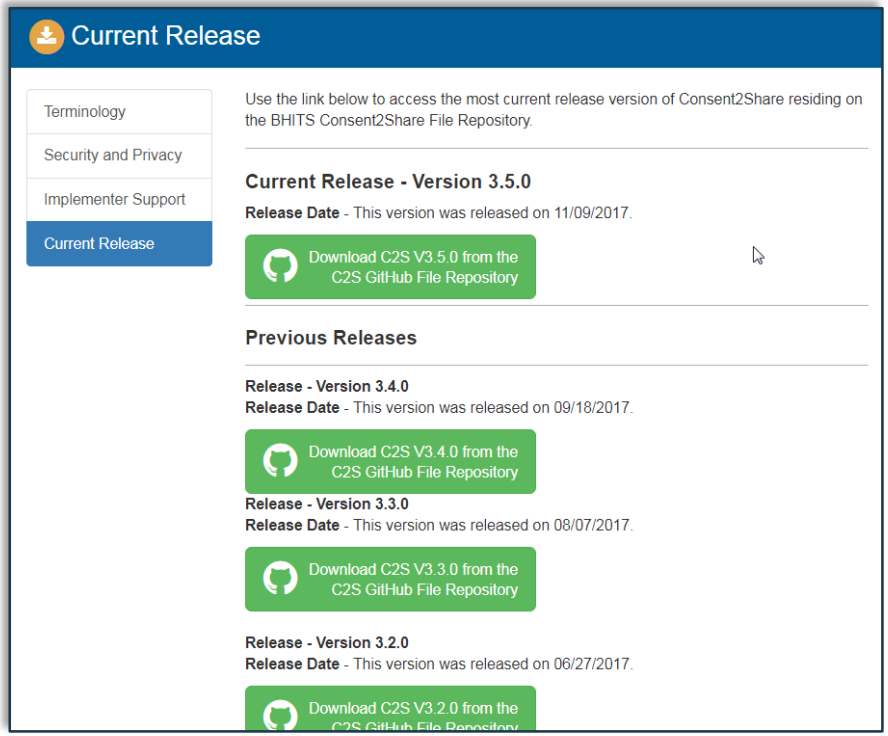
# Use Cases Page

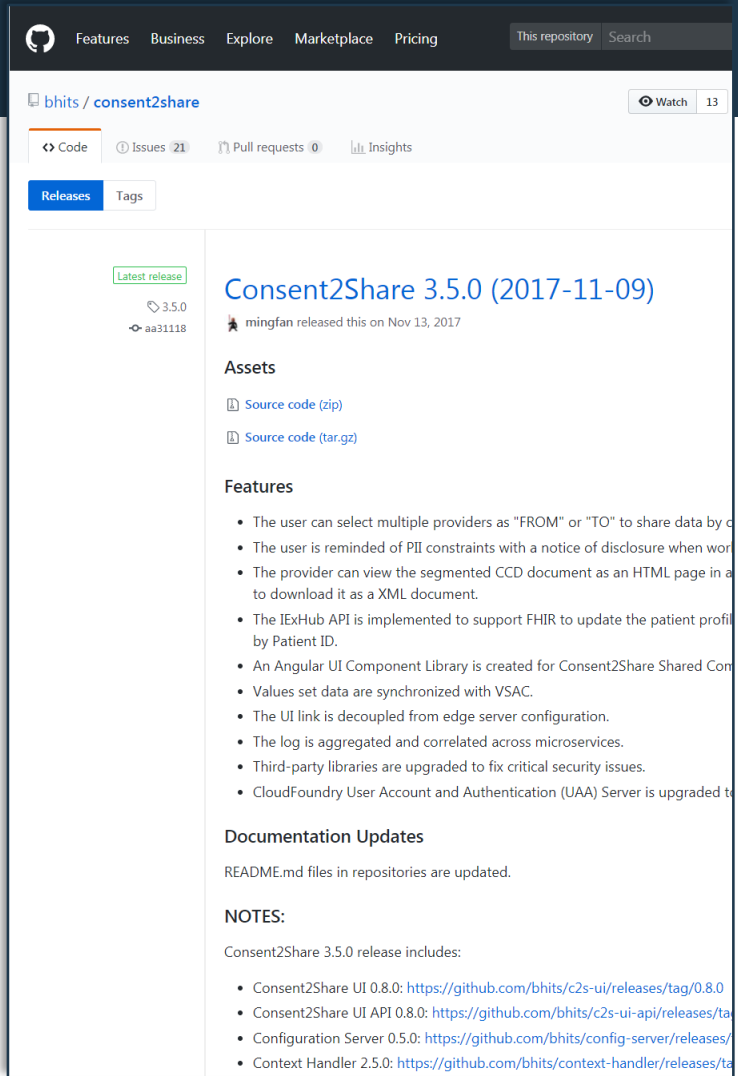
**Use Case**

Illustrates how patients can use Consent2Share to selectively share protected health information and adhere to 42 CFR Part 2 confidentiality regulations



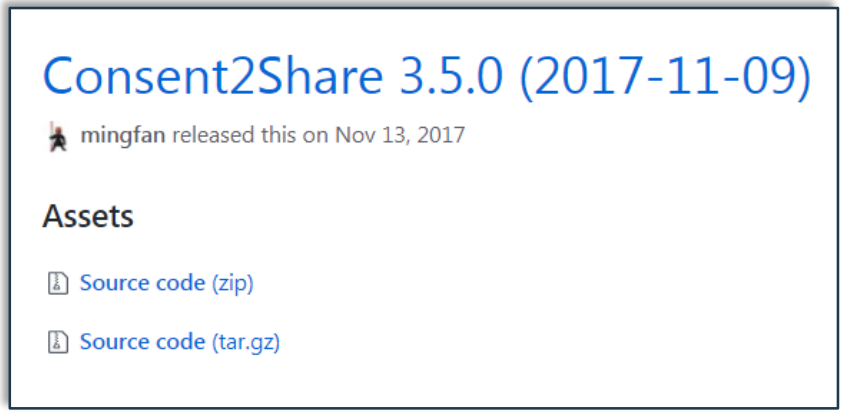
# Obtaining Consent2Share



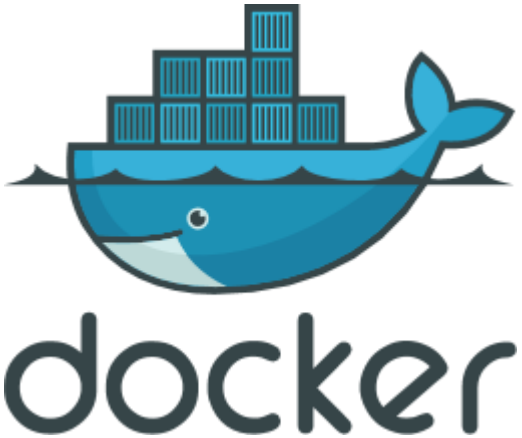


# Two Options to Run Consent2Share

A. Download source code and manually build the project




B. Deploy and run using Docker



# Select Edition

HIE Edition

Manual Edition

# Option 1: Download Option

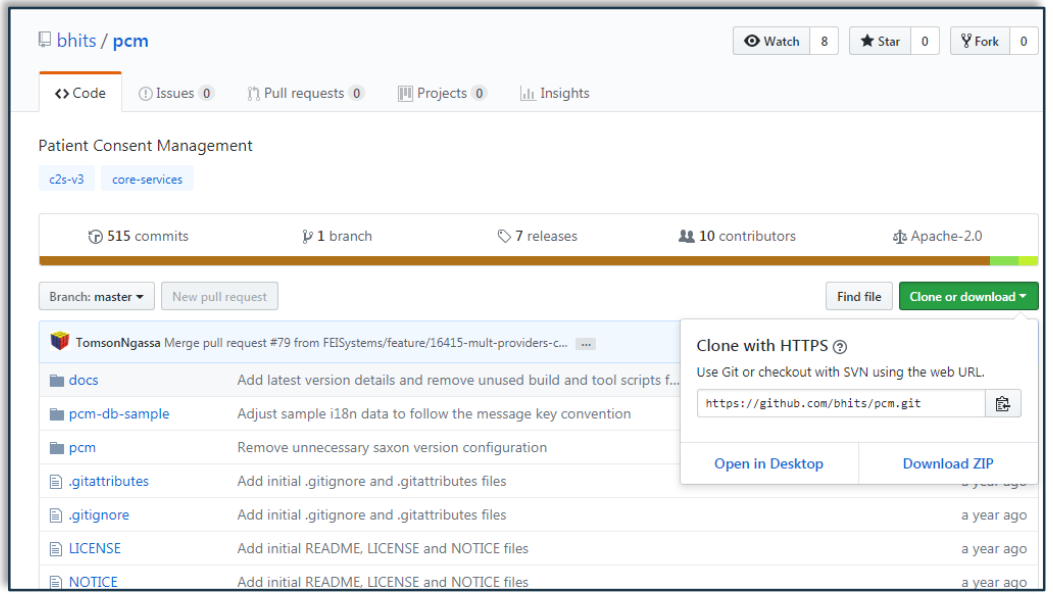
1. Setup your local development environment

2. Download source code from GitHub

$ git clone https://github.com/bhits/pcm.git

$ cd pcm/

$ git checkout 1.24.0



# Option 1: Download Option, Continued

3. Modify code for your program needs

4. Build and run application locally

   $ mvnw clean install

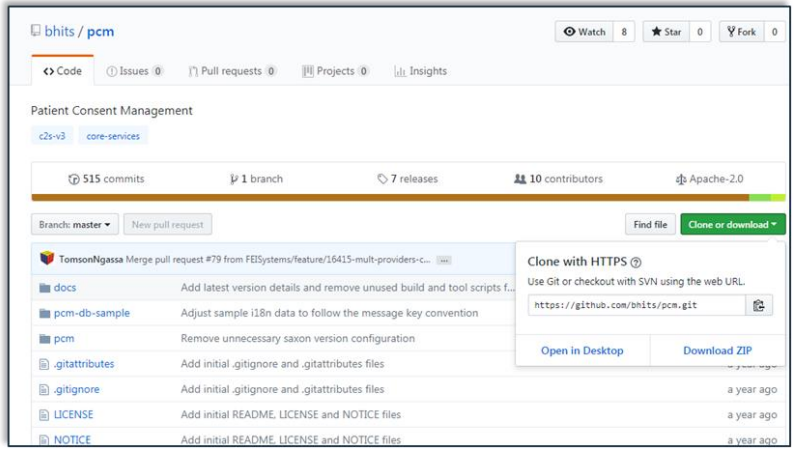
   ✓ Run as Docker container

   $ mvnw clean install docker:build

5. Deploy and Run Consent2Share

   $ java -jar pcm-x.x.x-SNAPSHOT.jar

   $ docker run -d bhits/pcm:latest



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# Option 2: Configure and Run Using Docker

- **Reference the Development and Deployment Guides**

1. Setup your local/server environment
   - ✓ Install Docker and Docker Compose

```
$ sh c2s_docker_install.sh
```

2. Configure your local/server environment

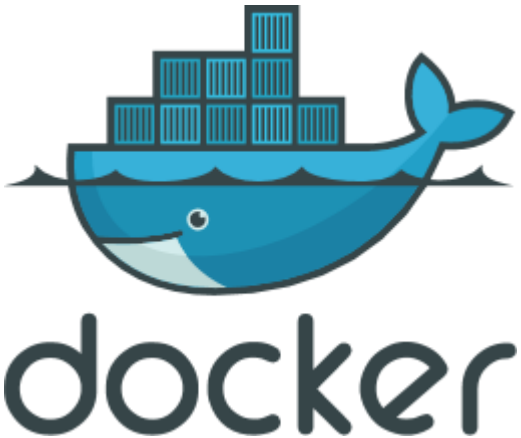
```
$ sh c2s_config.sh
```

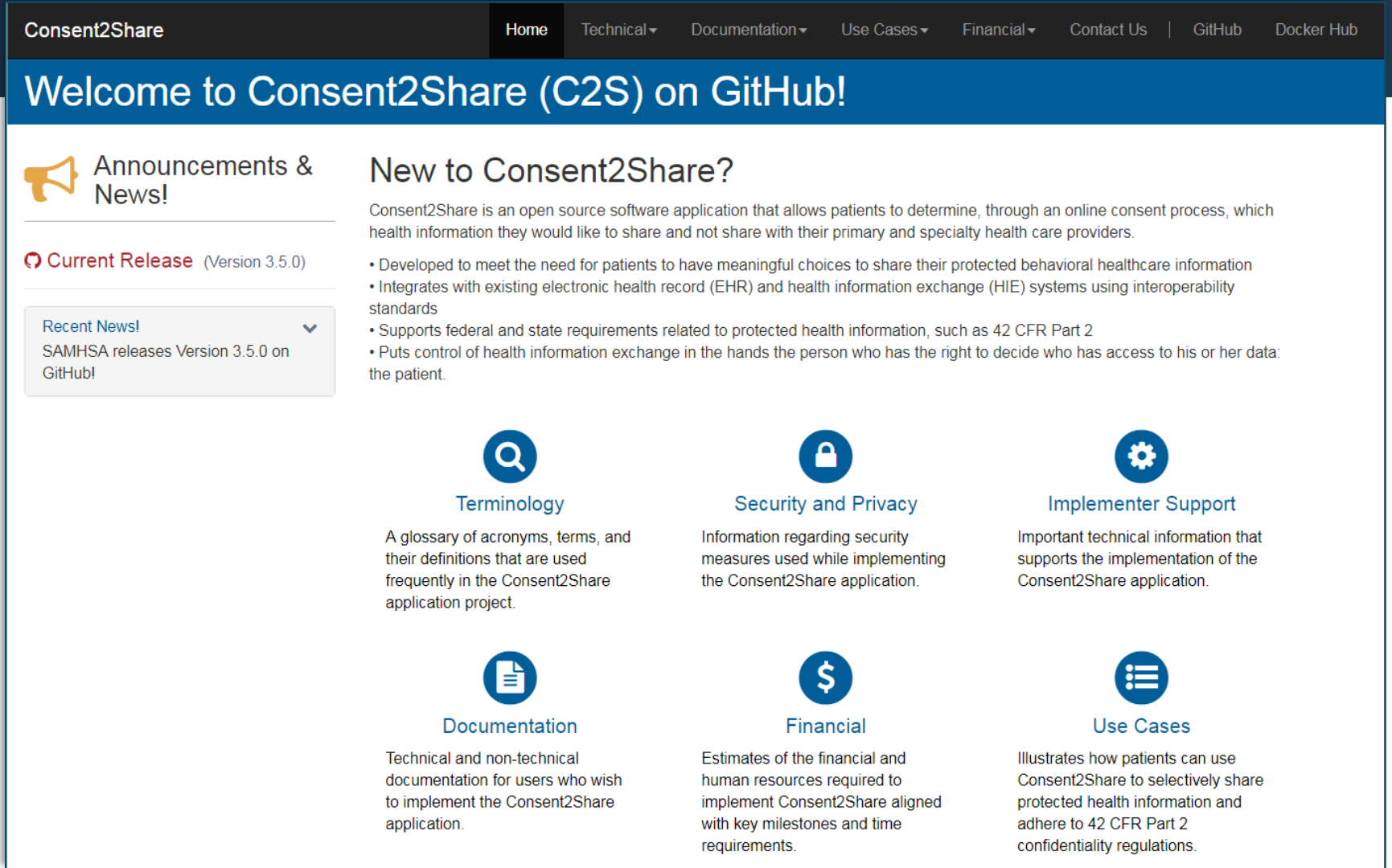
3. Select configuration option for environment

```
$ sh c2s_config.sh
This script is used to setup server configuration for Consent2Share.
1. EHR Edition App Server
2. EHR Edition DB Server
3. EHR Edition FHIR Server
4. HIE Edition App Server
5. HIE Edition Db Server
6. HIE Edition Hieos Server
Please select a server to setup:1
```

4. Use Docker Compose to run Consent2Share

```
$ docker-compose up -d
```




Consent2Share
Home
Technical
Documentation
Use Cases
Financial
Contact Us
GitHub
Docker Hub
Welcome to Consent2Share (C2S) on GitHub!
Announcements & News!
Current Release (Version 3.5.0)
Recent News!
SAMHSA releases Version 3.5.0 on GitHub!
New to Consent2Share?
Consent2Share is an open source software application that allows patients to determine, through an online consent process, which health information they would like to share and not share with their primary and specialty health care providers.
• Developed to meet the need for patients to have meaningful choices to share their protected behavioral healthcare information
• Integrates with existing electronic health record (EHR) and health information exchange (HIE) systems using interoperability standards
• Supports federal and state requirements related to protected health information, such as 42 CFR Part 2
• Puts control of health information exchange in the hands the person who has the right to decide who has access to his or her data: the patient.
Terminology
A glossary of acronyms, terms, and their definitions that are used frequently in the Consent2Share application project.
Security and Privacy
Information regarding security measures used while implementing the Consent2Share application.
Implementer Support
Important technical information that supports the implementation of the Consent2Share application.
Documentation
Technical and non-technical documentation for users who wish to implement the Consent2Share application.
Financial
Estimates of the financial and human resources required to implement Consent2Share aligned with key milestones and time requirements.
Use Cases
Illustrates how patients can use Consent2Share to selectively share protected health information and adhere to 42 CFR Part 2 confidentiality regulations.

# For More Information

## Contact Us

Additional Resources

HealthIT.gov (ONC)

The Office of the National Coordinator for Health Information Technology (ONC)

Contact Information

### SAMHSA Headquarters

Substance Abuse and Mental Health Services Administration
5600 Fishers Lane, Rockville, MD 20857

### Mailing Addresses

U.S. Postal Service Delivery
Substance Abuse and Mental Health Services Administration
5600 Fishers Lane, Rockville, MD 20857

Overnight Delivery (FedEx, UPS, Airborne Express, DHL, etc.)
Substance Abuse and Mental Health Services Administration
5600 Fishers Lane, Rockville, MD 20857

### Email Address

SAMHSA Health IT Team

For additional information, visit the SAMHSA Health Information Technology webpage.

# Technical Questions

If you have technical questions about Consent2Share, please email us at samhsa.hit@samhsa.hhs.gov



SAMHSA
Substance Abuse and Mental Health Services Administration