



TraCSS User Handbook

Version: 1.4 Date: 02/25/2026



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1 TraCSS Overview

1.1 Program Description

The Traffic Coordination System for Space (TraCSS) is a next-generation Space Situational Awareness (SSA) and Space Traffic Coordination (STC) system developed by the Office of Space Commerce (OSC) to fulfill the objectives of Space Policy Directive-3, which directed the transition of basic spaceflight safety services from the Department of Defense (DoD) to the Department of Commerce (DOC). TraCSS's primary mission is to enhance spaceflight safety and transparency by assuming Conjunction Assessment responsibilities from the United States Space Force's Mission Delta 2 (MD2) and by advancing SSA capabilities for the global space community.

TraCSS leverages and builds upon the trusted astrodynamics foundations established by MD2, specifically utilizing the Astrodynamics Support Workstation (ASW) software suite incorporating algorithms such as Astrodynamic State Propagation (ASP) and SuperCOMBO (close approach computation) to ensure technical continuity and interoperability. This approach enables TraCSS to deliver Conjunction Assessment results operationally equivalent to those provided by MD2, while introducing enhancements in screening frequency, reduced latency, and user interaction capabilities.

1.2 Key Services and Capabilities

- **Conjunction Assessment:** Continuous and on-demand Conjunction Assessment screenings identify potential collision risks between satellites and other space objects, enabling satellite operators to safely plan and execute collision avoidance maneuvers.
- **Ephemeris Ingestion and Screening:** Operator-submitted ephemerides are supported via the Orbit Comprehensive Message (OCM), integrated into routine operational and on-demand candidate screening.
- **Data Products:** Access to free, basic SSA services for commercial and civil operators is provided, including orbital data, Conjunction Data Messages (CDMs), and a suite of visualization tools.
- **Integration and Automation:** Built on scalable cloud infrastructure, TraCSS utilizes APIs to allow seamless integration and automation with a wide range of operational systems.
- **Data Transparency:** Publicly available SSA products include OMMs (TLEs), Break-Up Notifications (BUNS), Tracking and Impact Prediction Messages (TIPS), Owner/Operator (O/O) provided operational OCMs, and the full TraCSS Catalog (TraCSS Cat).
- **Operator Web-Based Tools:** A user-friendly web portal (TraCSS.gov) equipped with tools for satellite operators to visualize data products, manage organizational accounts, define user roles, download satellite data, and manage 3rd-Party Partner privileges to foster awareness, collaboration, and secure data sharing.

2 TraCSS Architecture

TraCSS is a system that is built on microservices. Each service is built around a specific business/logical function and can be developed, deployed, and scaled independently. For example:

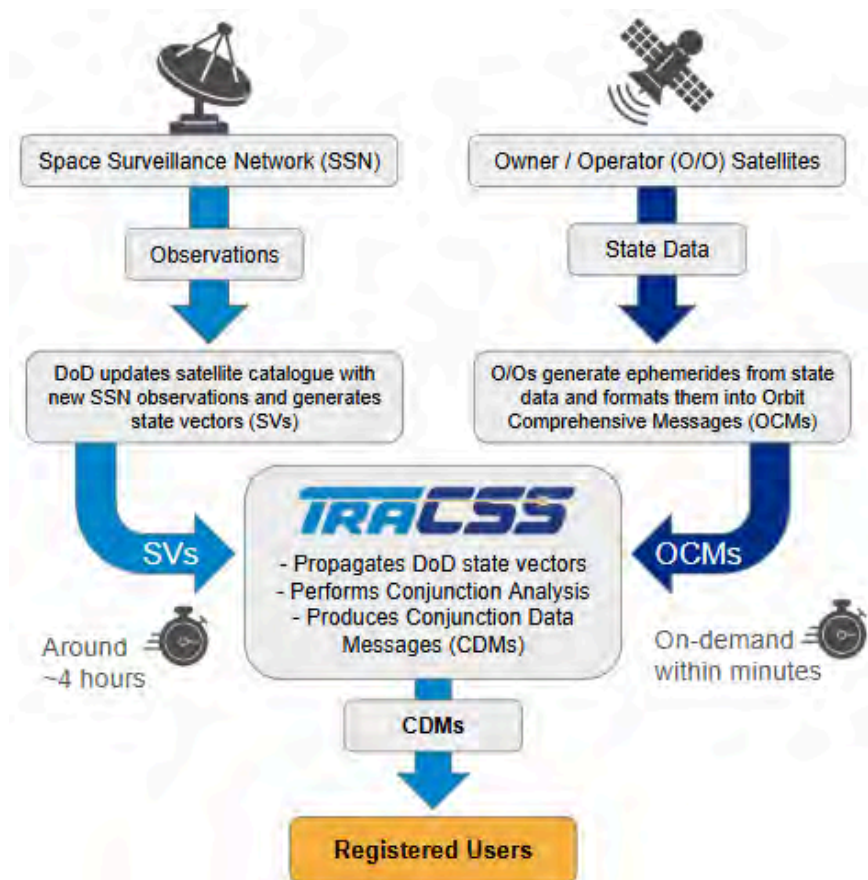
- One service manages user logins (Authentication) and what should be visible to each user according to the data policy (Authorization).
- Another service handles listening for event triggers, such as a user uploading an item that needs to be queued for processing.
- A third handles a message broker and allows users to “listen to” or “send on” specific topics for more content-specific information.

These services work together seamlessly through use of their Application Program Interfaces (APIs) but can also operate independently. If any particular service experiences issues, the system can continue to operate the unaffected services while restarting and recovering the faulted service. This is accomplished autonomously and does not impact the users’ experience. Through structuring the architecture in this manner, TraCSS is able to provide a robust system capable of scaling in capability as new features and functionalities are developed, tested, and implemented.

3 System Capability

3.1 Core TraCSS Functions

TraCSS ingests data from various sources, performs computations to detect conjunctions and operational risks, and delivers information and notifications to users through a suite of automated tools and interfaces. With the proliferation of satellites over the last decade, Space Traffic has grown exponentially. TraCSS addresses this growing need for congestion monitoring by transitioning the role of providing basic spaceflight safety services to the operational, research, and enthusiast communities from the U.S. Department of Defense (DoD) to a civil service under the U.S. Department of Commerce (DOC), as outlined in Space Policy Directive-3. This empowers the DoD to align their efforts with the objectives associated with their “Protect and Defend” mission, which includes Space Domain Awareness (SDA) and Space Traffic Management (STM) for assets that involve the DoD or for matters that involve national security.



3.2 Routine Conjunction Assessment

Conjunction Assessment (CA) is the process of identifying close approaches between two orbiting objects; sometimes called conjunction screening. TraCSS performs CA on ingested spaceflight data at regular intervals. The two types of CA screenings, or “runs,” are “*All vs. All*” and “*Payload vs. All*.” An *All vs. All* run uses every object in the catalog as the Primary (or Object1) list of candidates to be screened against all other objects in the catalog. A *Payload vs. All* run uses a subset of selected Primary (Object1) satellites. Objects that are debris, rocket bodies, non-commercial assets, or other similar objects are not included.

The *All vs. All* screenings are executed twice per day, approximately 12 hours apart from each other. The *Payload vs. All* screenings are executed 4 hours apart, 4 times per day; these screenings are bracketed between the two *All vs. All* screenings. *Payload vs. All* runs are designed to produce updates at a higher cadence to enable satellite owners and operators to make more effective operational decisions through improved SSA. Note that these time intervals are estimates due to the event-driven nature of TraCSS which processes data once it is received. Table 3.2.1 lists the routine screening times and types, both in Daylight Saving Time and Standard Time. Table 3.2.2 lists the routine screening details for Payload vs. All and All vs. All runs.

Table 3.2.1 - TraCSS Routine CA Screening Schedule

Screening Type	Screening Time (Daylight Savings Time)	Screening Time (Standard Time)
All vs All	0130 zulu	0230 zulu
Payload vs All	0530 zulu	0630 zulu
Payload vs All	0930 zulu	1030 zulu
All vs All	1330 zulu	1430 zulu
Payload vs All	1730 zulu	1830 zulu
Payload vs All	2130 zulu	2230 zulu

Table 3.2.2 - TraCSS Routine CA Screening Details

Screening Type	Primary Ephemerides	Secondary Ephemerides	Orbit Regimes
Payload vs All Run (every 4 hours)	All payload LEO1-4 SP ephemeris	All SP ephemeris and All "current" Operational OCMs	HAC LEO1-4
	All "current" operational Near Earth OCMs		OCM Near Earth
	All payload Deep Space SP ephemeris		HAC Deep Space
	All "current" operational Deep Space OCMs		OCM Deep Space
All vs All Run (twice a day)	All LEO1-4 SP ephemeris	All SP ephemeris and All "current" Operational OCMs	HAC LEO1-4
	All "current" operational Near Earth OCMs		OCM Near Earth
	All Deep Space SP ephemeris		HAC Deep Space
	All "current" operational Deep Space OCMs		OCM Deep Space

3.3 On-Demand Conjunction Assessment

In addition to receiving routine CA results, users also have the ability to perform on-demand screening. This is accomplished through uploading candidate or operational ephemeris data, formatted as an OCM. Operational on-demand screening can be utilized to determine if a current operational trajectory results in any future conjunctions. Furthermore, candidate on-demand screening can be utilized to develop and screen planned maneuvers against available catalog data.

On-demand screenings are ad-hoc in nature and executed independent of the routine CA runs. The results of on-demand screening are made available to users within the organization, based on their roles and permissions, as determined by the organization’s admin(s). For a description of user roles and permissions, refer to the [Account Types](#) section of this handbook. Operational screening ephemeris data provided by an O/O are made publicly available. Additionally, a subset of TraCSS Cat fields are updatable via the OCM submission. For a full description of updatable fields within the TraCSS Cat, please refer to the TraCSS Cat Spec. Candidate on-demand screening ephemeris data is not made visible other than to the organization that submits it.

Following account request approval, users are capable of self-issuing a clientId and a secretKey, through the “API” page on the TraCSS website, to enable authentication and access to the TraCSS Registered User APIs. Please refer to the [TraCSS APIs](#) section of this handbook for more information on available API products and services.

Table 3.3.1 identifies the OCM types and the corresponding response times for each service. Please note that response time may vary due to lapses in routinely ingested data.

Table 3.3.1 - OCM Conjunction Response Time

OCM Type	Response Time
Operational OCM	Every 4 hours with routine Screening
On-Demand Operational OCM	Response times vary based on system usage; generally on the order of minutes
On-Demand Candidate OCM	Response times vary based on system usage; generally on the order of minutes

3.4 TraCSS Screening Volumes

The following tables define the screening volumes and durations used by TraCSS for CA and OCM screenings. Screenings incorporate covariance-based “uncertainty volumes” surrounding each satellite, as well as the satellites’ physical dimensions (referred to as “exclusion volumes”). A screening volume refers to the tolerance around the predicted location of a satellite which determines a conjunction and initiates the creation of a CDM. TraCSS conducts screenings as a rectangular prism centered on the satellite’s center of mass with primary axes in the radial, in-track, and cross-track directions.

Table 3.4.1 - TraCSS HAC Screening Volumes

TraCSS Orbit Regimes	Orbit Regime Definition	Propagation Time	Screening Volumes		
			Radial	In-Track	Cross-Track
Deep Space	Perigee > 37500 km	10 days	24.5 km	24.5 km	24.5 km
GEO	27000 < Perigee ≤ 37500 km Eccentricity < 0.25	10 days	24.5 km	24.5 km	24.5 km
HEO	Perigee ≤ 37500 km Eccentricity > 0.25	10 days	24.5 km	24.5 km	24.5 km
MEO	2000 < Perigee ≤ 27000 km Eccentricity < 0.25	10 days	24.5 km	24.5 km	24.5 km
LEO 4	1200 < Perigee ≤ 2000 km Eccentricity < 0.25	5 days	0.4 km	2 km	2 km
LEO 3	750 km < Perigee ≤ 1200 km Eccentricity < 0.25	5 days	0.4 km	12 km	12 km
LEO 2	500 km < Perigee ≤ 750 km Eccentricity < 0.25	5 days	0.4 km	25 km	25 km
LEO 1	Perigee ≤ 500 km Eccentricity < 0.25	5 days	0.4 km	44 km	51 km
Other	Default regime when satellite cannot be assigned other regime	10 days	24.5 km	24.5 km	24.5 km

Table 3.4.2 - TraCSS OCM Screening Volumes

TraCSS Orbit Regimes	Orbit Regime Definition	Propagation Time	Screening Volumes		
			Radial	In-Track	Cross-Track
Deep Space	Period > 225 min	10 days	49 km	49 km	49 km
Near Earth	Period < 225 min	7 days	2 km	25 km	25 km
Other	Default regime when satellite cannot be assigned other regime	10 days	49 km	49 km	49 km

3.5 On-Orbit Risk Mitigation Maneuvers

In response to information received from CA notifications, or from other data sources, an O/O may consider performing Risk Mitigation Maneuvers (RMMs) to address an anticipated close approach. This process involves planning a trajectory change to reduce collision probability. If RMM actions are considered, an O/O may utilize the TraCSS on-demand candidate screening service to validate potential maneuvers against the entire catalog and other O/O provided ephemerides. When a final predictive ephemeris is chosen, an O/O should upload their ephemeris in the form of an operational or operational on-demand OCM to be screened against and included within the catalog. Any resulting CDMs are provided to the O/O both via the TraCSS Registered User API and the O/O Conjunctions and Data products tabs within the TraCSS App.

4 Data Products

4.1 Public Data

Most of the data, information, and products generated and used by TraCSS are accessible by the general public without registering for a TraCSS account. The data products outlined in Table 4.1.1 are made openly available through the TraCSS Open Data Dissemination (TODD) service:

Table 4.1.1 - TraCSS Public Data Products

Data Product	Description	Update Cadence
TraCSS Satellite Catalog (TraCSS Cat)	Includes satellite attributes sourced from the DoD public satellite catalog (SATCAT), the NASA mass and size catalog, and directly from satellite O/Os	4 hrs
Operational Orbit Comprehensive Messages (OCMs)	Satellite ephemerides with covariance and maneuver plans provided by satellite O/Os Can be submitted to TraCSS via OCM upload	When Received
Orbit Mean Elements Messages (OMMs)	Catalog generated based on DoD public element sets catalog with TLEs included	4 hrs
Break-Up Notifications	Mirrors break-up notifications generated by the DoD	When Generated

The TODD service is accessible through the TraCSS Public API. For more information on the public API and using the TODD service, please refer to the [Public API](#) section. For more information on the TraCSS open data policy, refer to the [TraCSS Data Policy](#). For a detailed description of these data products to include specific formatting parameters, please view the associated specification documents in the Specifications Docs section at TraCSS.gov/Resources.

4.2 Registered User Data

Some data, information, and products generated and used by TraCSS are made available on a restricted basis to registered TraCSS users. The data products listed in Table 4.2.1 are restricted and made available only to registered TraCSS users:

Table 4.2.1 - TraCSS Registered User Data Products

Data Product	Description	Release Cadence
Conjunction Data Messages (CDMs)	Provided for all conjunctions that involve assigned satellites For on-demand screening, CDMs are posted as generated	4 hrs or When Generated
TraCSS Owner/Operator Directory	Operational contact information provided by satellite O/Os registered in TraCSS New information is made available upon receiving updates from O/Os	When Received
Candidate Orbit Comprehensive Messages (OCMs)	Candidate satellite ephemerides for assigned satellites with covariance and maneuver plans provided by satellite O/Os Results returned within seconds/minutes, dependent on file size, and only visible to the O/O that submits them	N/A
Tracking and Impact Prediction Messages (TIPs)	Mirrors TIPs generated by the DoD Nominally posted upon generation. TIPs can be accessed via the Bulk Data API service.	When Generated

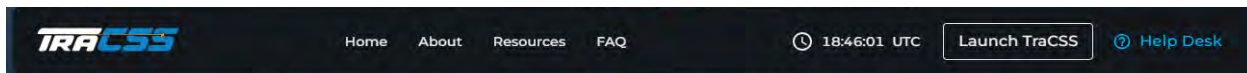
These data products are made accessible to registered users via the TraCSS Application (TraCSS App) and through the TraCSS Registered User APIs. For more information on requesting an account and managing access to user data, refer to the [Account Structure](#) section of this guide. To view the full list of data products available through TraCSS, refer to the [TraCSS Data and Information Policy](#). For more information on the formatting specifications for a given data product, refer to the Specification Docs section at [TraCSS.gov/Resources](#)

5 Accessing TraCSS

5.1 TraCSS Website

TraCSS.gov is a publicly accessible website owned and managed by OSC. It serves as the primary gateway for viewing TraCSS data and the most recent news related to the program. Users of publicly available TraCSS data are not required to register for an account within TraCSS and may access public data through the website and API as a non-registered user. Satellite owners and operators are encouraged to register their organizations for a TraCSS account to access the comprehensive range of SSA data and services offered within the TraCSS App.

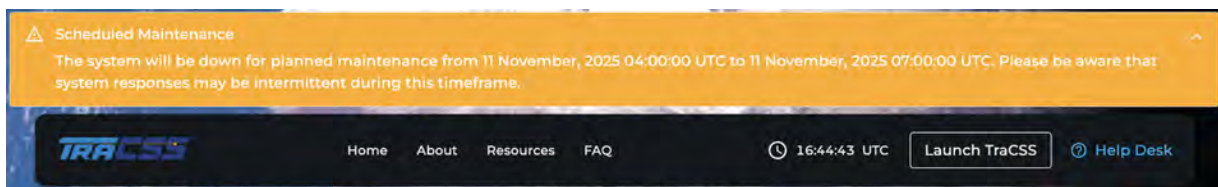
At the top of the TraCSS.gov public landing page, the navigation bar enables users to access publicly available pages, launch the TraCSS App, and visit the Help Desk.



TraCSS Public Landing Page - Navigation Bar

Note: The TraCSS Help Desk feature is currently still under development. Please refer to the [TraCSS Operation and Support](#) section for information on how to contact the TraCSS team.

The Resources page contains the latest user documentation including the TraCSS User Handbook, how-to guides of common workflows, specification documents of TraCSS data products, API and system user guides, and policies and user agreements. The FAQ page provides the most up-to-date answers to commonly asked questions. The Help Desk is the primary method for submitting all questions, issues, and feedback related to TraCSS. At times, the TraCSS Operations Team may deem it necessary to provide system wide notifications to the TraCSS community. TraCSS.gov displays these messages as banners at the top of the webpage.



TraCSS System Wide Notification

5.2 TraCSS Application

The TraCSS App is the primary access point for satellite O/Os to manage their organization’s account, coordinate with other registered users, access web-based versions of the TraCSS data products and visualization tools, and provide 3rd-Party Partner access to their organization’s satellite data.

Users that do not own or operate satellites are not required to register for a TraCSS account to access the publicly available data products that are provided. Access to the TraCSS App is restricted to satellite owners and operators to provide data products and services that are uniquely tailored to satellite operations.

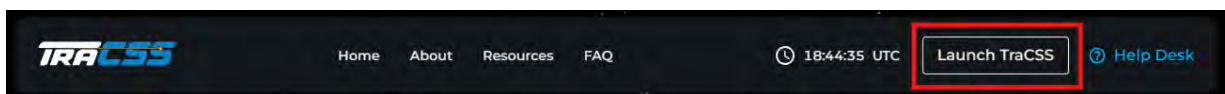
The following products are accessible on TraCSS.gov to non-registered, public users:

- **Resources:** Links out to the TraCSS resources page containing how-to guides, specification documents, user guides, and policies/user agreements.
- **FAQ:** Links out to commonly asked questions with the latest answers provided by the TraCSS Operations team.

The following data products are accessible to non-registered, public users through the TODD service via the TraCSS [Public API](#):

- **TraCSS Cat:** Displays the full public TraCSS catalog of space objects containing satellite attributes.
- **Data Products:** Enables viewing and downloading of TraCSS generated data products including an O/O provided OCMs, OMMs (TLEs), and BUNS.

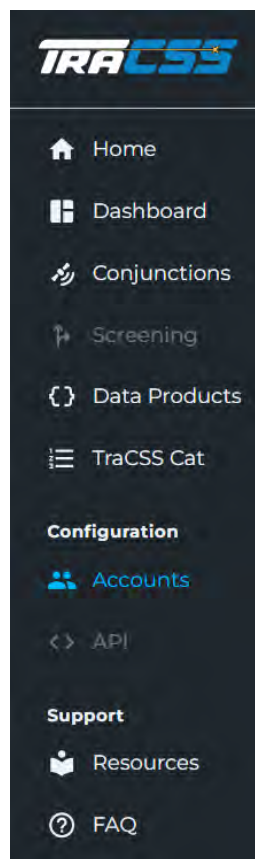
Organizations that currently, or in the near future will own or operate satellites should begin the account request process by navigating to TraCSS.gov and clicking the “Launch TraCSS” button on the navigation bar and then following the “Sign-Up” workflow.



TraCSS Public Landing Page - Launch TraCSS

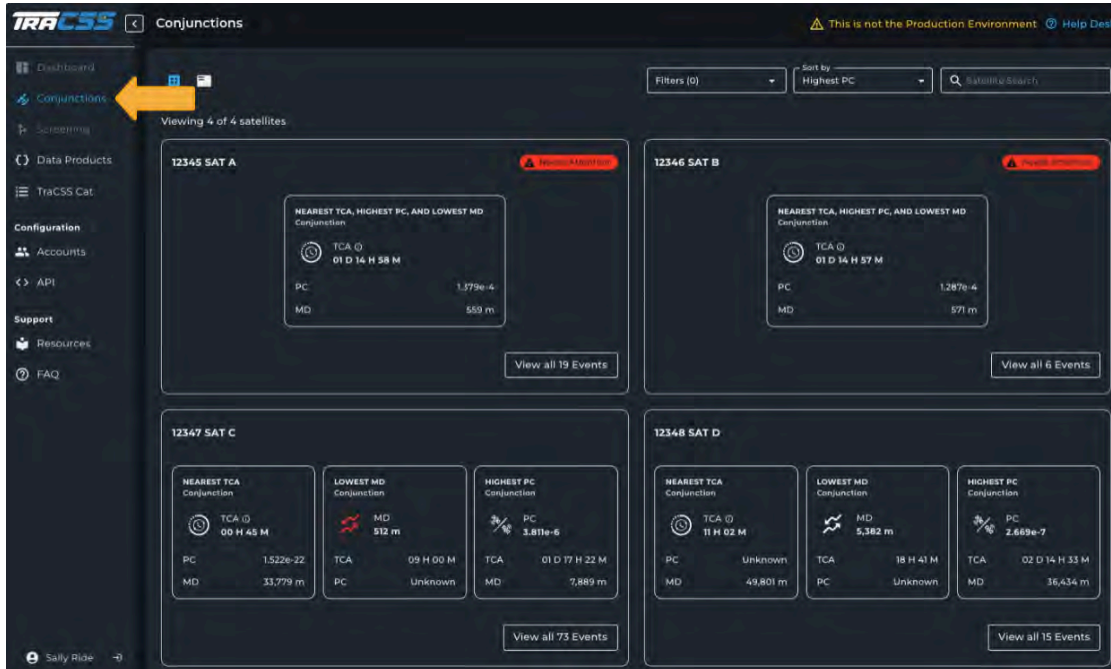
For detailed instructions on requesting an account, please view the [How To Request An Account Guide](#). Organizations that do not own/operate satellites, but that require access to data pertaining to satellites owned/operated by another organization, should **NOT** request an account themselves. Rather, access should be granted by the O/O organization providing access to the data through the O/O's TraCSS account using the 3rd party partner feature. Please refer to the [Data Sharing - 3rd Party Partner](#) section for more information. For more information on account types and structure within TraCSS, please view the [Account Structure](#) section within this handbook.

Returning registered users should click the "Sign In" button to access the TraCSS App. Once signed-in, the navigation bar on the left-hand side of the screen is updated to include the additional resources available to registered users.



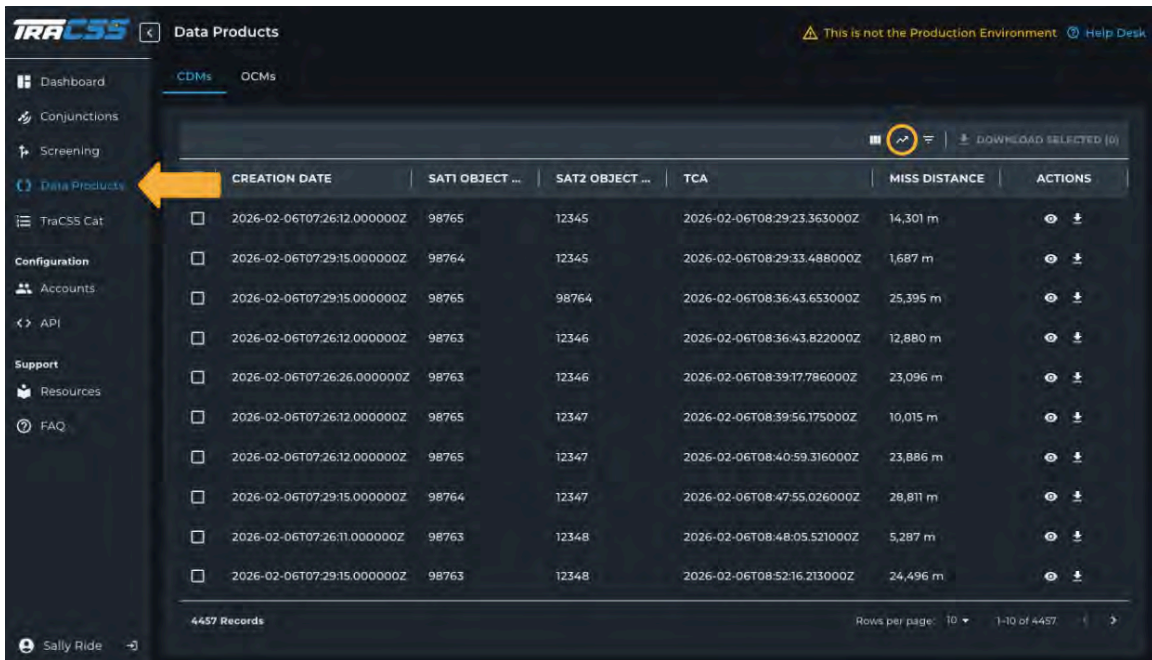
TraCSS App - Navigation Bar

- Conjunctions:** Provides a high-level summary of the latest data on all active conjunctions for objects assigned to a registered user's organization through satellite tiles. Each tile highlights the highest risk conjunctions for a given satellite across three metrics of interest – Time of Closest Approach (TCA), Probability of Collision (Pc), and Miss Distance (MD).



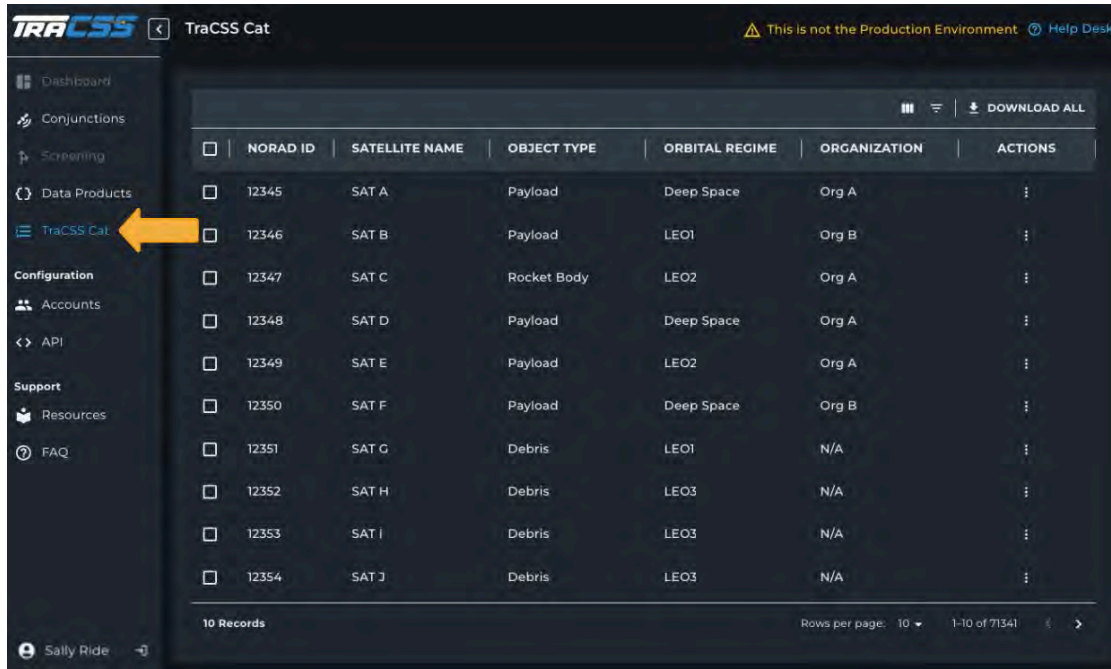
TrACSS App - Conjunctions Page

- Data Products:** Enables viewing and downloading of TraCSS generated data products including CDMs and OCMs. The column headers can be used to filter and sort data products based on various fields. Data can be exported using the checkbox selection and download tools. When viewing CDMs, use the Correlation ID dropdown to view data from a specific screening. For more information on the generation and cadence of TraCSS data, refer to the [Data Products](#) section of the TraCSS Handbook.



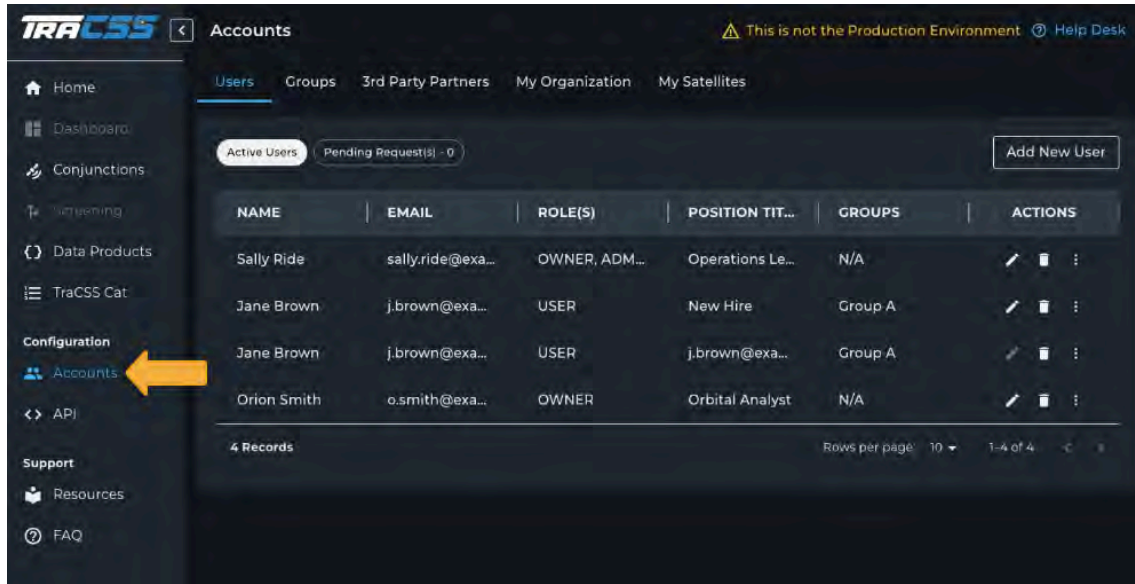
TraCSS App - Data Products Page

- TraCSS Cat:** Displays the full public TraCSS catalog of space objects containing satellite attributes. The column headers can be used to filter and sort objects based on any satellite attribute. Data can be exported using the checkbox selection and download tools.



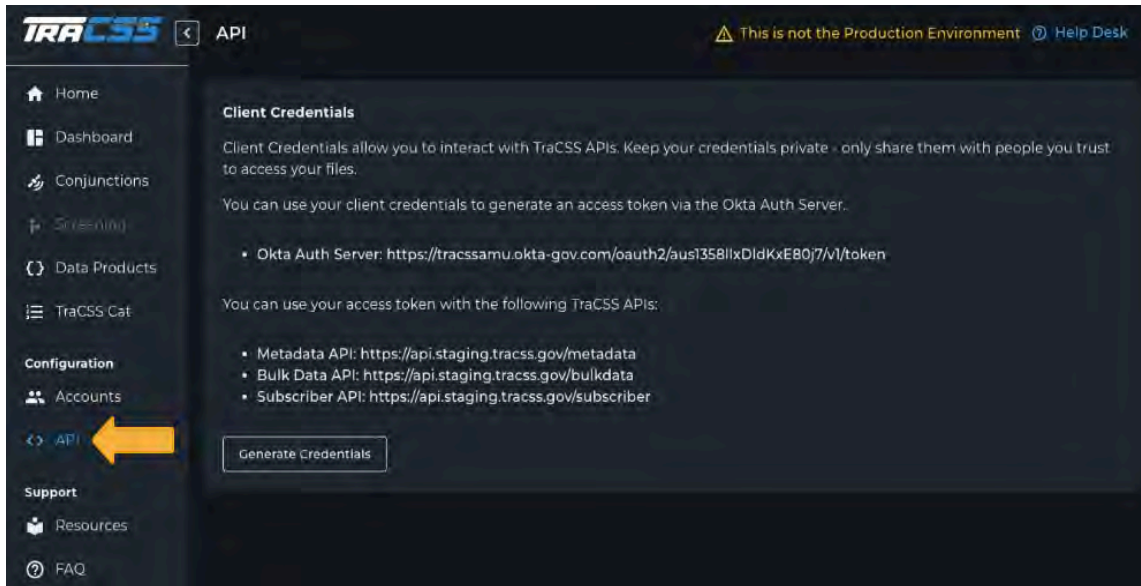
TraCSS App - TraCSS Cat Page

- **Accounts:** Provides a central administrative hub for managing users, satellites, groups, and 3rd party partners. For more information on specific account management help documentation, view the relevant How-Tos under the “User Management” header on the [Resources Page](#).



TraCSS App - Accounts Page

- **API:** Enables TraCSS API interactions through the generation and management of client credentials. For more information, refer to the [Registered User API](#) section below.



TraCSS App - API Page

- **Dashboard:** Presents summary statistics on active conjunction events including secondary object breakdowns, 7-day conjunction forecast, and a snapshot of high-risk conjunctions.



TraCSS App - Dashboard Page

5.3 TraCSS APIs

APIs are the communication channels that allow users to “call” the TraCSS microservices directly using commonly available tools like cURL, Postman, SOAP-UI, and Hoppscotch, or through dedicated programming languages such as Python, Java, Ruby, Go, etc. These API calls are structured requests that interact with the TraCSS system, adhering to the definitions outlined in the associated Swagger pages. There are examples of how to invoke these calls in later sections of this document, however it is not the purpose of this document to educate users on the unique implementation in each language/software option. Example tools for this include:

- **Postman:** A UI-based client application that sends requests to an API endpoint and receives the response. Postman simplifies the process of interacting with an API without a need for extensive technical knowledge.
- **Hoppscotch:** A free and open-source API development environment that helps users to quickly build requests and interact with APIs.
- **cURL:** A simple command-line tool that allows interaction with an API by specifying a URL and the data/request to send
- **Python:** A high-level, general purpose programming language that can be leveraged for building automated and repeatable requests to an API

These software tools (and others) can be used by those who want to interact directly with the back-end of the TraCSS system. Users interacting with the API are assumed to have a basic understanding of API technologies, possess the requisite software development skills, and be prepared to interact with the TraCSS system on a machine-to-machine level.

5.4 Public API

The Public API is available to public users and TraCSS registered users through the TODD service. A TraCSS account is not required to access the publicly available data products that are provided through the TODD service. The API documentation in this User Handbook is applicable to the Public API with the exception of authentication. A `clientId` and `secretKey` is **NOT** required to access the Public API. For information on Public API usage and a list of TODD service data products, API endpoints, and example queries, please refer to the [TODD API User Guide](#).

5.5 Registered User API

The Registered User API is only available to satellite O/O's that have registered for an account with TraCSS and that have satellites assigned to their organization. For a description of the registered user data products accessible through the APIs, refer to [Table 4.2.1](#). Users who choose not to interact with TraCSS via the API are encouraged to use the TraCSS App and the pre-built options provided therein. A description of the capabilities that exist in the TraCSS App can be found in the [TraCSS Application](#) section.

Each request to the Registered User API requires proper authentication before it is processed. The authentication ensures data security and control based on roles defined on the user's account. For more information on the roles based access that is implemented on TraCSS, please refer to Table 6.1.1 in the [Account Structure](#) section.

To authenticate and begin interacting with the API, users must provide a JavaScript Object Notation (JSON) Web Token (JWT) with each request to the TraCSS system. Credentials for authentication (**`clientId`** and **`secretKey`**) can be self-issued via the TraCSS App within the "API" tab. These credentials are used to authenticate through the OKTA service and receive the required JWT needed for the other API requests.

The process for accomplishing the authentication is outlined in the [Using TraCSS Registered User API](#) section. For instructions on self-issuing the required `clientId` and `secretKey`, please refer to the [How to Access TraCSS APIs](#) guide on the resources page of [TraCSS.gov](#).

5.6 TraCSS API Microservices

The TraCSS Services that a user may access are grouped into distinct parent services. Each of the services has a dedicated URL for its API, and associated Swagger UI documentation page. These primary service collections are listed in Table 5.6.1.

Table 5.6.1 - TraCSS Microservices

API Service	Purpose	Access
TODD (TraCSS Open Data Dissemination)	Used for retrieving public data that is not restricted or classified without requiring a TraCSS registered user account. This service is useful for general, public users interested in space traffic data <ul style="list-style-type: none"> • Downloading the TraCSS Cat or OMM Catalog 	Public API
Data Provenance	Used for retrieving the status of routine and on demand runs. Useful for owner/operators wanting to know when their data will be available. <ul style="list-style-type: none"> • E.g. Checking the historical log of events such as the status of a previous routine screenings 	Registered User API
Metadata	Used for retrieving and publishing the most recent data. Useful for operational purposes. <ul style="list-style-type: none"> • E.g. Downloading CDMs / Uploading OCMs 	Registered User API
Bulk Data	Used for retrieving large quantities of historical information. Beneficial to users analyzing trends in data. <ul style="list-style-type: none"> • E.g. Downloading large volumes of data products up to 30 days old • E.g. Querying Tracking and Impact Prediction Messages (TIPs) 	Registered User API

5.7 Retrieving TraCSS API Services Documentation

Interaction with TraCSS via the API is provided through five primary services. Documentation for the available paths and operations can be accessed online using the links in Table 5.7.1. Current TraCSS Pilot Users interacting with TraCSS MVP, please refer to the note below Table 5.7.1 for instructions on accessing the swagger documentation.

Table 5.7.1 - TraCSS API Services Swagger Documentation

API Service Name	Swagger Documentation
Data Provenance	https://api.prod.tracss.gov/dataprovenance/swagger-ui/index.html https://api.tracss.gov/dataprovenance/swagger-ui/index.html
Metadata	https://api.prod.tracss.gov/metadata/swagger-ui/index.html https://api.tracss.gov/metadata/swagger-ui/index.html
Bulk Data	https://api.prod.tracss.gov/bulkdata/swagger-ui/index.html https://api.tracss.gov/bulkdata/swagger-ui/index.html
TODD	https://api.prod.tracss.gov/todd/swagger-ui/index.html https://api.tracss.gov/todd/swagger-ui/index.html
Table Legend	<p>Currently Supported on TraCSS MVP</p> <p>Future Support for TraCSS 1.4</p>

Note: Current TraCSS Pilot Users should refer to the prod (MVP) swagger documentation until TraCSS 1.4 has been released. Updates will be provided when 1.4 is released to direct users to begin referring to the newer swagger documentation.

5.8 Using TraCSS Registered User API

Making a call to a TraCSS API is a two-step process:

1. Use the **clientId** and **secretKey** that was provided after registering through the TraCSS App to authenticate and retrieve a JSON Web Token (JWT).
2. Call the TraCSS Rest API, presenting the JWT as the Authentication bearer token.

After receiving the JWT, the user can use it to make calls to one of the TraCSS exposed APIs. Details for each of the five services can be found in the respective user guides with recommendations of best practices and example queries.

- [TraCSS Data Provenance API User Guide](#)
- [TraCSS Metadata API User Guide](#)
- [TraCSS Bulk Data API User Guide](#)
- [TraCSS TODD API User Guide](#)

For assistance with troubleshooting API response codes, please refer to the API Response Codes User Guide. This guide includes examples of common response codes, their meanings, and potential solution steps. For more information on common API usage mistakes, please reference section [5.9](#) of this handbook.

- [TraCSS API Response Codes User Guide](#)

5.9 Common API Usage Mistakes

Below are some commonly encountered mistakes or false assumptions when interacting with the TraCSS API. These are intended to assist in troubleshooting before reaching out for assistance from the OPS Support Team.

- **Time to Live:**

Many things only exist in the TraCSS system for a certain amount of time. This is to maximize efficiencies such as computing cost and the speed of the system, ensure users are not receiving any stale or no longer relevant data, and for security, the below items have the following “expiration dates” or TTL (Time to Live).

Table 5.9.1 - Item Expiration Timeline

Item	Time to Live
JWT	24 hours from creation
CDMs in Metadata	10 days from the day it was generated
OCMs in Metadata	Until the “stop time” of the OCM is 5 days old
CDMs in Bulk Data	30 days from the day it was generated
OCMs in Bulk Data	30 days from the day it was uploaded

- **Header Only parameter:**

Allows a caller to determine if the full contents of the request are desired before making a larger call for all the underlying data. Setting the “headersOnly” parameter to “true” unintentionally can cause returned data outside of expectations. Note that this parameter is only available for certain API calls, but gives useful details from the headers, such as:

- How big the full package would be
- What type of content is inside
- When it was last updated or if it’s okay to access

- **Content-Type Parameter:**

"Content-Type" must be `multipart/form-data`
Other options like "Content-Type: text/plain" are not valid.

- **URL Character Encoding:**

Users may need to insert HTML URL Encoded characters in place of ASCII characters for some languages and parsers to properly understand the request. Common characters used that may need substitution are shown in Table 5.9.2.

Example API call with a substitution:

```
None
curl -v -H "Authorization: <token>"
'https://api.tracss.gov/metadata/tracssCdm?countOnly=true&creationDate=%3E<date>'
```

Table 5.9.2 - Common Potential Character Substitutions

ASCII	Encoded	ASCII	Encoded	ASCII	Encoded
space	%20	&	%26	@	%40
!	%21	,	%2C	;	%3B
`	%27	-	%2D	.	%2E
"	%22	(%28	:	%3A
#	%23)	%29	?	%3F
\$	%24	/	%2F	<	%3C
%	%25	\	%5C	>	%3E

6 Account Structure

6.1 Account Types

There are two registered user account types within TraCSS:

- **Satellite Owner/Operator (O/O)**
 - Organizations with the authority to claim satellites within TraCSS, through either ownership or authority to operate over the specified objects
 - Receive TraCSS Restricted Data including CDMs for their satellites and the operational contact information of other TraCSS Registered Users
 - Ability to upload data and utilize the full suite of TraCSS services
- **3rd Party Partner**
 - Organizations that require access to read and or write data pertaining to satellites owned or operated by another organization
 - Organizations providing space situational awareness services to other O/O organizations
 - Granted access to TraCSS Restricted Data directly by O/O organizations
 - Ability to upload data and utilize TraCSS services based on permissions granted by O/O organizations

Table 6.1.1 summarizes the user types within TraCSS and their respective access permissions. The “System Role” column defines the role of the user as it is commonly displayed within TraCSS. The “Satellite Access” column identifies what level of satellite privilege is granted to the user. The “Read/Write” column details the default permissions granted for the satellites accessible to the user. Read permissions give the user the ability to view all available TraCSS data on the satellite. Write permissions give the user the ability to make changes to the satellite’s TraCSS Cat entry and upload operational and candidate OCMs for the satellite.

Table 6.1.1 - User Roles Types and Privileges

User Type	System Role	Satellite Access	Read/Write Permissions
O/O Accounts			
Organization Admin	OWNER, ADMIN	All Org Satellites	Read All Write All
Organization User	OWNER	All Org Satellites	Read Only All
Group Admin	GROUP_ADMIN, USER	Only Group Satellites	Read All in Group Write All in Group
Group Member	USER	Only Group Satellites	Read All in Group
Base User	USER	No Satellites	None
3rd-Party Accounts			
Organization Admin	ADMIN, SSA	All Org Satellites Assigned by O/O Organization(s)	Read All Write All
Organization User	SSA	All Org Satellites Assigned by O/O Organization(s)	Read Only All
Group Admin	Group_Admin, USER	Only Group Satellites	Read All Write All
Group Member	USER	Only Group Satellites	Read Only All

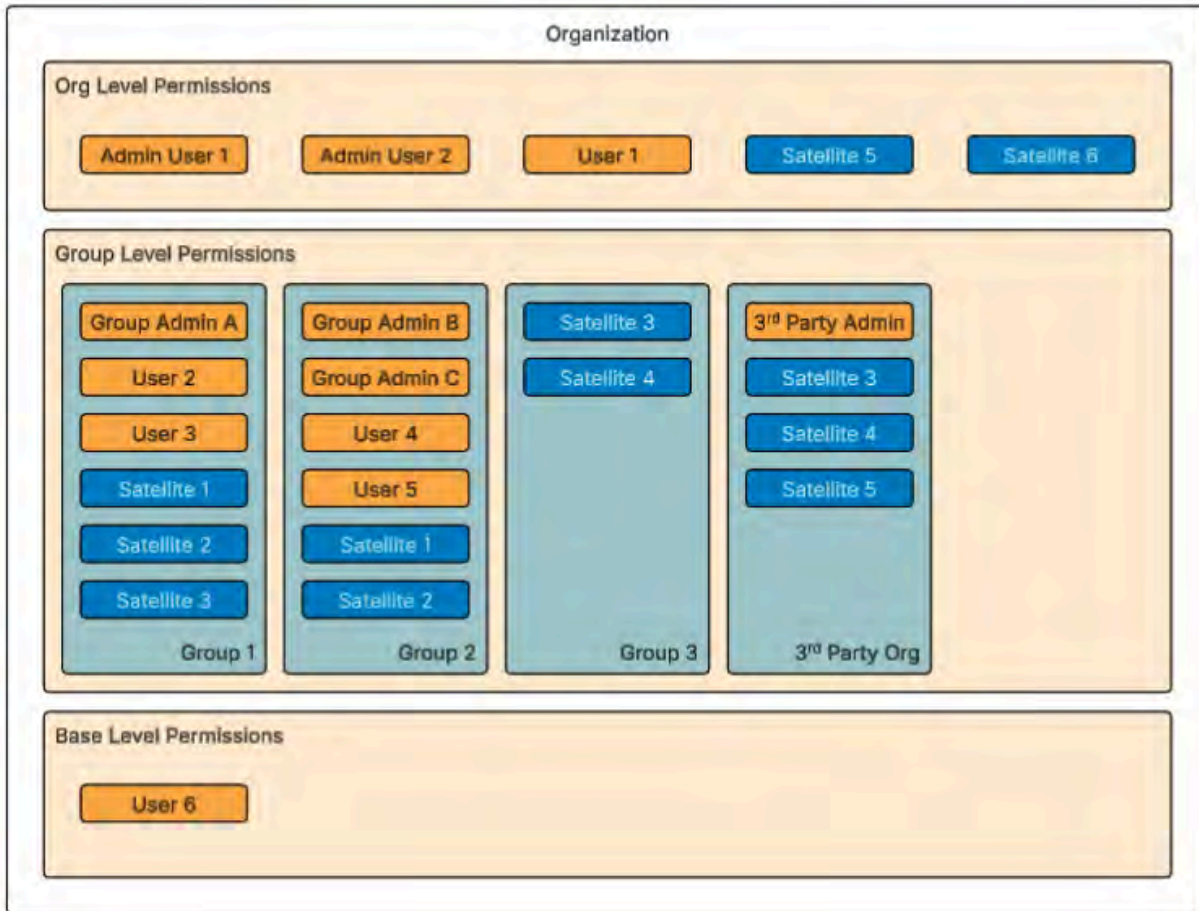
Note: A Base User is only created when a user belongs to a group and that group is deleted. To elevate a Base Users privileges, either add them to another group or assign them the Organization Admin or Group Admin role(s).

6.2 Organization Structures

The account structure within TraCSS is driven by O/O organizations. An example organization structure for an O/O is shown in the Example Organization Structure Diagram Within TraCSS on the following page. At the highest level of permission are the organization's admins. Organization admins have the ability and accountability to add users, claim existing satellites from the catalog, and add 3rd Party Partners to their organization. Additionally, they can create and manage groups to permit users within their organization read and/or write access to specific satellites. Organizational admins have the authority to set permissions and privileges for all users within their organization.

Groups consist of satellites and users. When a user belongs to a group, their access is restricted to the satellites within the group. A satellite can be added to multiple groups, but a user can only belong to a single group. Group admins maintain write permissions for all satellites belonging to a group, while groups users are restricted to read-only access for the satellites within the group. A group can have multiple admins and has no restrictions on the number of users or satellites that can belong to the group. For more information on creating and managing groups, please see the respective How-To documents under the "User Management" header at TraCSS.gov/Resources.

Non-admin users that do not belong to a group fall into one of two categories: an organization level account with read access to all satellites within the organization or the base level user account with no access to satellites.



Example Organization Structure Within TraCSS

The example organization above highlights the customization available through groups. Some important notes on this organization structure:

- Group admins have full read and write access to satellites within their group.
- Non-admin users within a group have read access to the satellites belonging to their group.
- Satellites 1 and 2 are visible to all users within Group 1 and 2, while Satellite 3 is only visible to users within Group 1.
- Satellites 5 and 6 do not belong to a group and are visible to Admin User 1, Admin User 2, and User 1, with write access being restricted to the admins.

- Group 3 has no assigned admin, therefore Satellites 3 and 4 are only visible to Admin User 1, Admin User 2, and User 1, with write permissions being limited to the admins.

Note: *The structure of group 3, with no assigned admin, enables organizational level users to filter conjunctions by group within the conjunctions page*

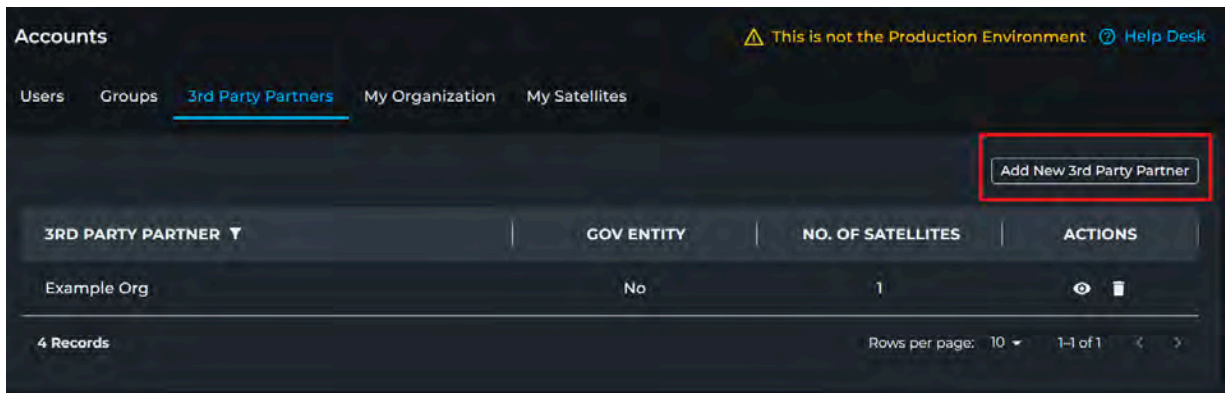
- The 3rd-Party Org group is assigned satellites 3, 4, and 5 by Admin User 1 or 2. Users within the group are managed by the 3rd Party Admin
- User 1 has organizational level, read access to all satellite belonging to the organization
- User 6 has base level permissions with no access to satellites

Step-by-step guides on managing users, satellites, and groups within an organization can be found in the User Management section at TraCSS.gov/Resources.

Note: *All users within an organization are managed by the organization admin(s). After the initial account approval, the TraCSS Operations team has no further involvement in the addition and organization of new users. To get started with adding additional users to an organization, follow along with the [How To Add Users Guide](#).*

6.3 Data Sharing - 3rd Party Partners

TraCSS provides the capability to permit TraCSS App and API access to an organization's data to 3rd-Party Partner organizations through the "Add New 3rd Party Partner" feature within the Accounts page. Read and/or write access for satellites belonging to an organization can be granted to 3rd Party Partners allowing seamless data sharing and integration of operational practices between organizations.



TraCSS App - Add New 3rd-Party Provider Feature

3rd Party Partner organizations must be added by the granting O/O organization's organizational level admin(s). When a new 3rd Party Partner organization is added to an O/O's organization, an invitation to join TraCSS and set up the 3rd Party Partner account will be sent to the admin belonging to the 3rd Party Partner organization that was denoted during the creation process.

After the account setup process is completed, the admin of the 3rd Party Partner can add additional users to the account in the same manner that O/O organizations add new users. Additionally, 3rd Party Partner admins can create groups and assign the satellites that they've been granted access to, and users in the same manner as O/O organizational level admins.

Add 3rd Party Partner

Organization Name
Example Org

Headquarters
Headquarters
United States

Add Admin Contact

First Name John	Last Name Doe
Phone Number (+1) 123-456-7891	Email JohnDoe@gmail.com

Assign Satellites
Satellites (21)

Cancel Add

TraCSS App - Add 3rd-Party Provider Creation Page

Note: O/O organizational level admins have the capability to assign satellites to the 3rd Party Partner organization at the time of addition. Satellite privileges and permissions can be updated at any time by accessing the 3rd Party Partner tab and editing the satellite assignment.

Multiple 3rd Party Partners can be added to an O/O organization's account. It is the responsibility of the O/O organization's admin(s) to manage permissions and privileges granted to 3rd Party Partners. It is highly recommended to ensure that appropriate vetting practices have been performed prior to permitting access to 3rd Party Partners to prevent unauthorized access to the organization's data.

7 TraCSS Operations and Support

The TraCSS Operations Team provides tiered support to prioritize the safety of spaceflight operations. Support levels are categorized by situational urgency in two support periods: Routine Support Hours and After Hours Support.

7.1 TraCSS Operational Schedule

The TraCSS Operations Team is available every day for resolution of routine account issues and issues involving high risk conjunctions from 1300 zulu to 0430 zulu during Standard Time (November 1st to March 7th) and 1200 zulu to 0330 zulu during Daylight Saving Time (March 8th to October 31st). Both time periods correspond to 6:00 AM to 5:30 PM Mountain Time to preserve local initiation and termination times for the Operations Team shift schedule.

Table 7.1.1 - TraCSS Operations Team Support Hours

Operations Support Period	Daylight Saving Time	Standard Time
Routine	1200 - 0330 zulu	1300 - 0430 zulu
After Hours	0330 - 1200 zulu	0430 - 1300 zulu

Users should email tracss.help@noaa.gov for all support requests, including administrative issues, provisioning, and technical inquiries related to high-risk conjunction events. All requests are processed during standard business hours. Any inquiries submitted outside of this period will be addressed by the on-shift crew during the next routine support window.

8 Documentation & Contact Info

8.1 Help Documentation

The latest TraCSS registered user and public user help documentation and user guides can be found at TraCSS.gov/Resources. How-to guides covering topics related to the website, application, and APIs can be found here. The resources page can also be accessed within the TraCSS App by registered users by using the "Resources" button on the navigation bar.

8.2 Specifications, Policies, & Agreements

The latest and historical data product specifications and example files can be found in the Specifications Docs section at TraCSS.gov/Resources. All policies and user agreements can be found in the Data Policy section at TraCSS.gov/Resources.

8.3 Frequently Asked Questions

All Frequently Asked Questions (FAQs) related to TraCSS and their most up-to-date answers can be found at TraCSS.gov/FAQ. If a specific question is not answered in the FAQs, please submit a new question by emailing support at tracss.help@noaa.gov.

8.4 Contact Info

Please submit all questions, issues, and feedback through the help desk email at tracss.help@noaa.gov

To join the TraCSS waitlist to become a registered user, please visit [OSC - TraCSS](#) for details and instructions.

For any additional questions regarding TraCSS, please contact the TraCSS Outreach team by email at tracss.outreach@noaa.gov.

9 TraCSS PRA Compliance

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act (PRA) of 1995 unless the information collection has a currently valid OMB Control Number. The approved OMB Control Number for this information collection is **0648-0831**. Without this approval, we could not conduct this information collection. Public reporting for this information collection is estimated to be approximately 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. All responses to this information collection are voluntary. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the NODC Data Officer, SSMC3, 4th Floor, E/OC, 1315 East West Highway, Silver Spring, MD 20910. Geospatial metadata is requested in accordance with Executive Order 12906 and NOAA Administrative Order 212-5.

9.1 Privacy Act Statement

Authority: The collection of this information is authorized under 5 U.S.C. § 301, Departmental regulations which authorizes the operations of an executive agency, including the creation, custodianship, maintenance and distribution of records, and 15 U.S.C. 1512, Powers and duties of the Department.

Purpose: NOAA collects limited information, such as name, address, phone number, or email address for a variety of purposes. This information will be used to respond to user inquiries or provide services requested by the user.

Routine Uses: Disclosure of this information is permitted under the Privacy Act of 1974 (5 U.S.C. Section 552a) to be shared among Department staff for work-related purposes. Disclosure of this information is also subject to all of the published routine uses as identified in the Privacy Act System of Records Notice COMMERCE/NOAA-11, Contact Information for Members of the Public Requesting or Providing Information Related to NOAA's Mission.

Disclosure: Furnishing this information is voluntary. By providing this information, you are consenting to the use of that information only for the purpose for which it is submitted.

10 Revision History

VERSION	DATE	PAGES AFFECTED	DESCRIPTION
1.4.0	Feb, 25, 2026	All	Initial Release