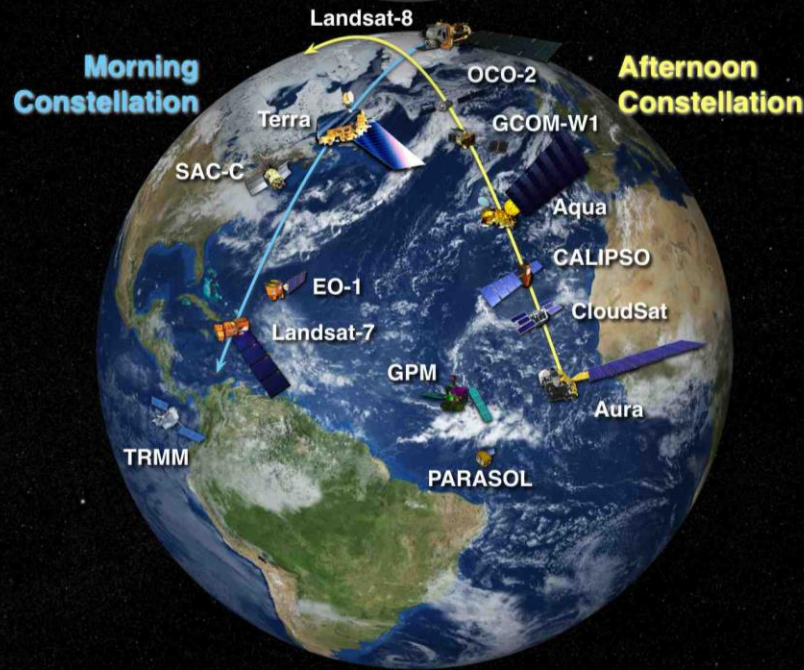




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International Earth Science Constellation

Mission Operations Working Group

December 04 – 06, 2018

Constellation Visualization Tool Set-up

Christopher Axthelm, Systems Engineer, a.i. solutions, Inc., NASA GSFC Code 595

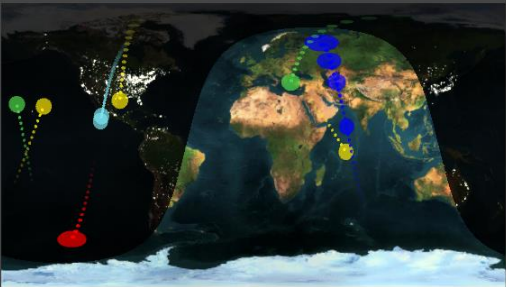
Agenda

- Constellation Visualization Tool (CVT) Updates
- Mission Products
- Constellation Coordination System (CCS) Subscriptions
- CVT Menus
- CVT Demo
- Questions?

Constellation Visualization Tool

- Released version 1.0.4 to NASA ESMO on November 28, 2018.
- New release added GPM, ICESat-2, and ISS.
- Regrouping of CloutSat and CALIPSO into their own “C-Train”.
- The Constellation Visualization Tool (CVT) version 1.0.3 is available to request from the NASA software catalog!
 - Available to US persons and foreign national partners.
 - <https://software.nasa.gov/software/GSC-17917-1>

CVT 1.0.4

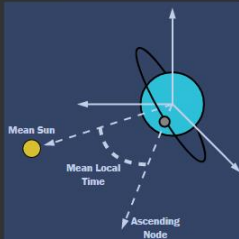


Mean Local Time (MLT)

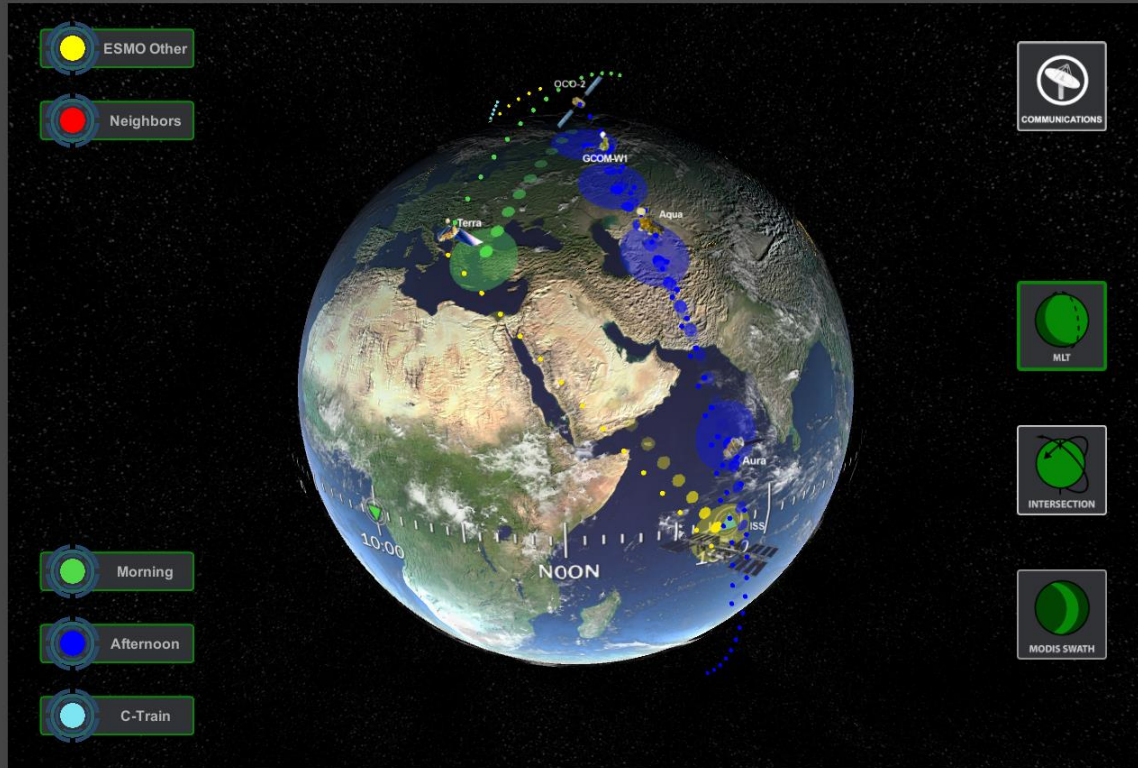
The Morning and Afternoon Constellations fly in frozen, sun-synchronous orbits.

The Afternoon Constellation ascends across the equator at roughly 13:30 local time on each orbit.

Sun-synchronous orbits are designed so that each crossing of the equator occurs at the same mean local time (MLT).



Flying constellations in sun-synchronous orbits minimizes the global variations in altitude and allows the science instruments on the spacecraft to observe the same points on the earth at regular intervals and at a consistent sun angle.



ESMO Other

Neighbors

Morning

Afternoon

C-Train

COMMUNICATIONS

MLT

INTERSECTION

MODIS SWATH

10:00

NOON

2018-10-31
09:10:19 UTC
Paused











700X



Mission Products

- The thirteen missions available in CVT require products that use specific naming conventions (detailed next slides).
- CVT will use any subset of mission products made available to it.
 - If an entire grouping of spacecraft is missing, the grouping button will automatically be hidden on the User Interface (UI).
- CVT can pick up product files from a local drive folder or an FTP (File Transfer Protocol) location.

Mission Products

Spacecraft	CCS Product Rule	File Template
Aqua	Aqua - Ephemeris - Predicted (STK3 format)	PM_EOSEPHM<n>_<ddd>_<yyy y>_<vv>.e
Aura	Aura - Ephemeris - Predicted (STK format)	CH_EOSEPHM<n>_<ddd>_<yyyy >_<vv>.e
OCO-2	OCO2 - No-burn Predicted Ephem STKv8 (Converted to STK3)	OC2_PRED_EPHEM_STK3_<yyy y>_<MM>_<dd>_<vv>.e
GCOM- W1	GCOM-W1 - No-burn Predicted Ephemeris (Converted to STK 3.0)	SOEMP- PRE_GCOMW1_<yyyy><MM><d d>_<hh><mm><ss>.E
CloudSat	CloudSat - Predicted Ephemeris (Converted to STK3)	CS_PRED_EPHEM_<yyyy>_<M M>_<dd>_<vv>_STK.E
CALIPSO	CALIPSO - Predicted Ephemeris Converted to STK	CAL_PREDICTED_EPHEMERIS _<yyyy>_<MM>_<dd>_<hh>_<m m>_<ss>.E

Mission Products

Spacecraft	CCS Product Rule	File Template
Terra	Aqua - Ephemeris - Predicted (STK3 format)	PM_EOSEPHM<n>_<ddd>_<yyy y>_<vv>.e
Landsat-7	Landsat 7 - Ephemeris - Predicted STK Formatted	L7<yyyy><ddd>LS7EPH.S<vv>
Landsat-8	Landsat-8 Predicted Ephemeris (Converted to STK 3.0 Format)	506_FDS_STKPredEphem_<yyyy> ><ddd><hh><mm><ss>_<aaaa>< bbb><cc><ee><ff>_OPS.e
GPM	GPM - Ephemeris - From TLE (CCSDS OEM format)	GPM_FromTLE_<yyyy><MM><d d><hh><mm><ss>_<aaaa><bb><c c><ee><ff><gg>.OEM
ICESat-2	ICESat-2 - Ephemeris - From TLE (CCSDS OEM format)	ICESat- 2_FromTLE_<yyyy><MM><dd>< hh><mm><ss>_<aaaa><bb><cc>< ee><ff><gg>.OEM

Mission Products

Spacecraft	CCS Product Rule	File Template
ISS	ISS - Ephemeris - From TLE (CCSDS OEM format)	ISS_FromTLE_<yyyy><MM><dd><hh><mm><ss>_<aaaa><bb><cc><ee><ff><gg>.OEM
TanSat	TanSat - Ephemeris - From TLE (CCSDS OEM format)	TanSat_FromTLE_<yyyy><MM><dd><hh><mm><ss>_<aaaa><bb><cc><ee><ff><gg>.OEM

CCS Subscriptions

- All mission ephemeris products used by CVT can be obtained from CCS.
- CCS subscriptions can be created to automatically send newly acquired products to the user's email address and/or FTP location.
 - Email subscriptions will send the new products to the email inbox of the user account owning the subscription.
 - FTP subscriptions will require supplying CCS with a location and login information.

CCS Subscriptions



Christopher Axthelm [Logout](#)

Constellation Coordination System (CCS)

19:40:39 UTC

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Administration

Products

[Product Rules and Files](#)

Product Subscriptions

[Manage Product Rules](#)

Missions

Constellations

Tools

Utilities

My Account

About Us

Product Subscriptions

Create New Subscription

Modify Existing Product Subscriptions

[Active](#)[Mission ↑](#)[Product Rule](#)

Filter Subscriptions

You do not have any product subscriptions.

My Transfer History

[Subscription](#)[To](#)[Status](#)[Last Activity](#)

Filter Transfer History

You have not requested any subscription transfers.

CCS Subscriptions

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Product Subscriptions

Create Product Subscription

Required fields are marked with an asterisk (*).

Mission*

Product Rule*

Product Delivery Method(s)*

Deliver Products As Email Attachment?*

FTP Site Address*	FTP Server Path	FTP Username*	FTP Password*	Use SFTP	Passive Mode	
				No Yes	No Yes	Test

If this is the first time CCS will connect to a location using SFTP, please [contact CCS Support](#) to ensure successful Product Subscription deliveries.

CCS Subscriptions




Christopher Axthelm [Logout](#)

The subscription has been successfully created!

Constellation Coordination System (CCS)

12:07:14 UTC

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[Administration](#)

Products

[Product Rules and Files](#)

Product Subscriptions

[Manage Product Rules](#)

[Missions](#)

[Constellations](#)

Product Subscriptions

Create New Subscription

Modify Existing Product Subscriptions

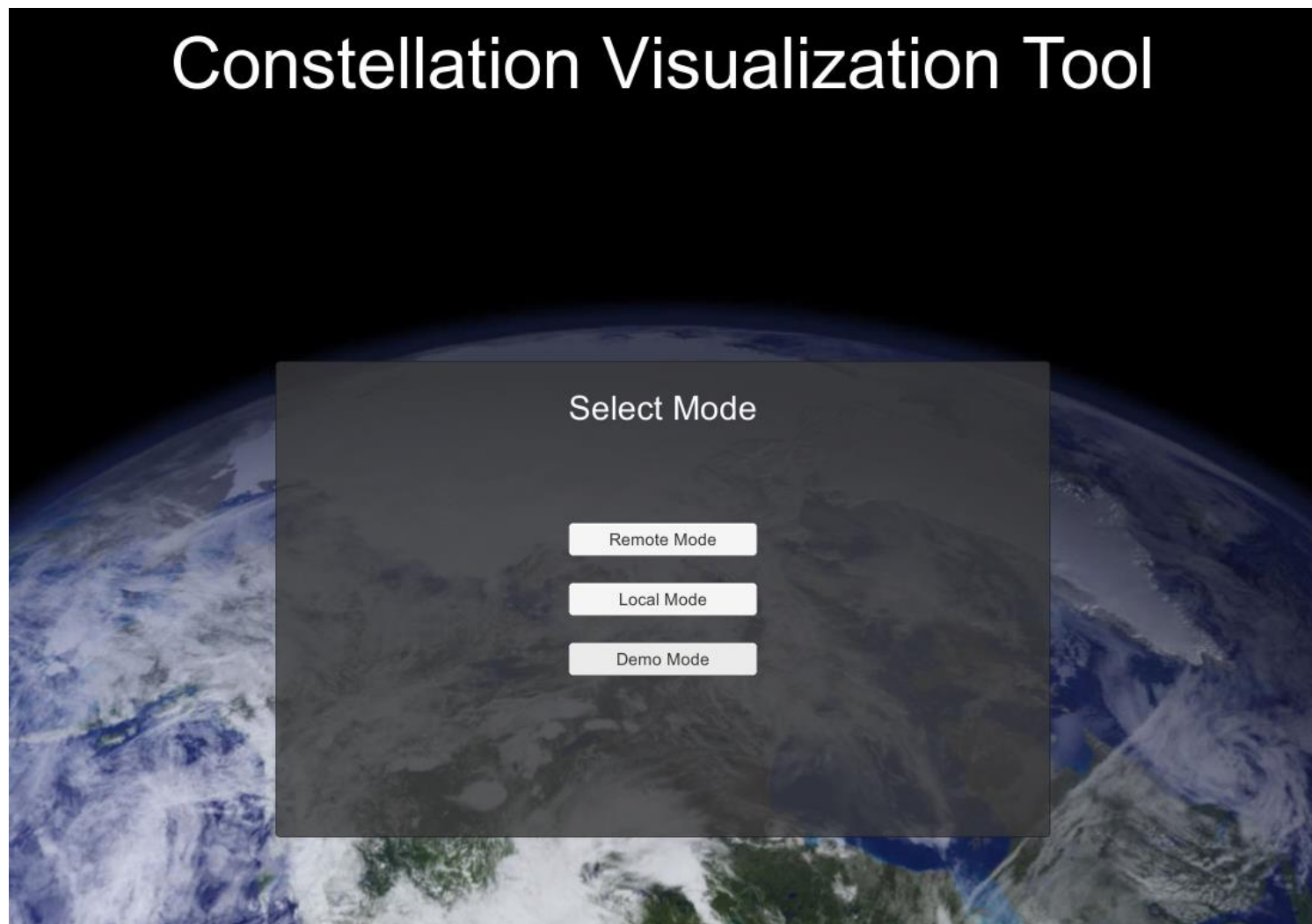
Active	Mission ↑	Product Rule	
No <input checked="" type="button" value="Yes"/>	Aqua	Aqua - Ephemeris - Predicted (STK3 format)	Transfer Edit Delete

Filter Subscriptions

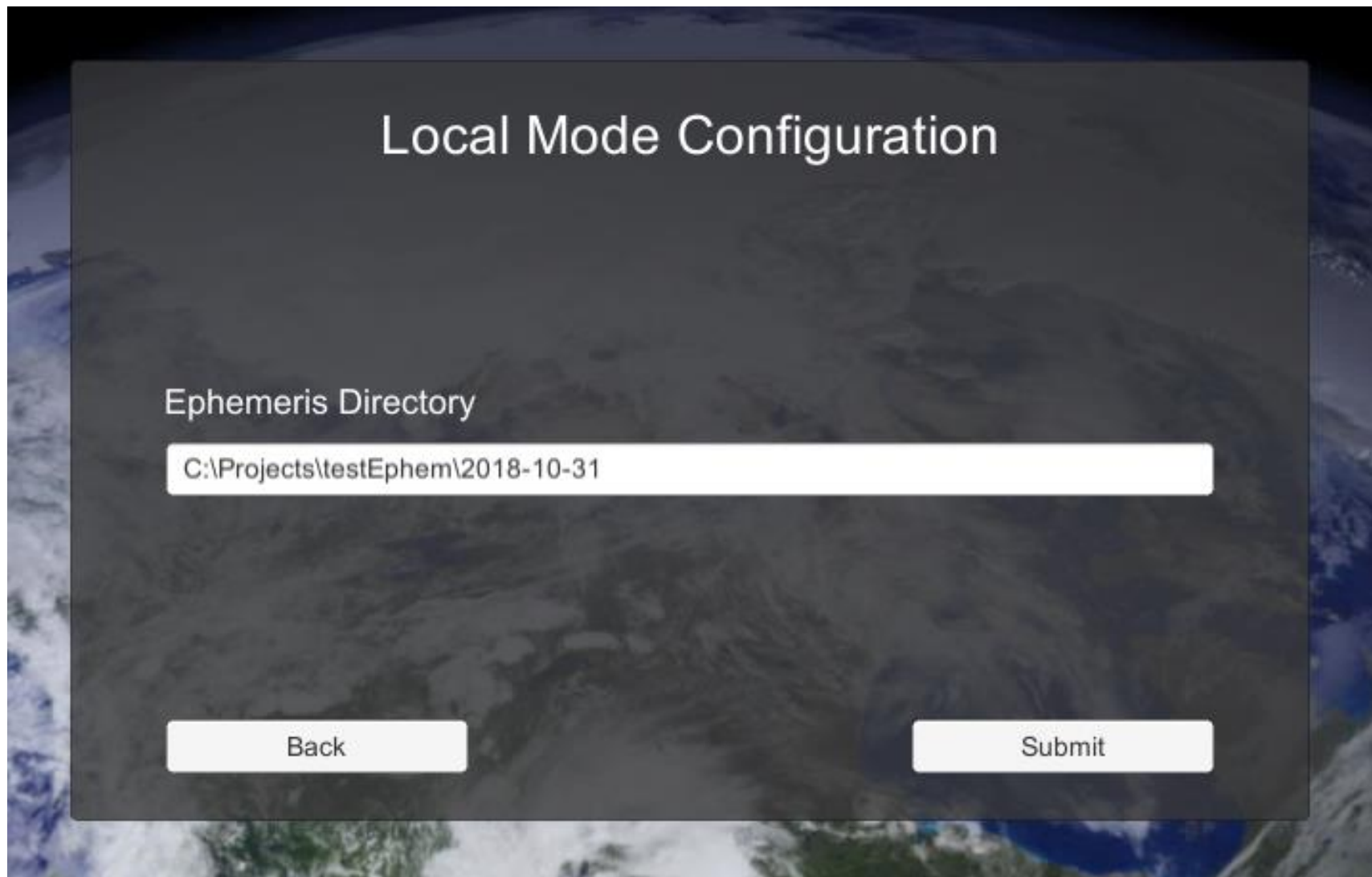
CVT Menus

- Once the mission ephemeris products have been obtained, CVT needs to be configured to reach the files.
- After CVT has been successfully configured the first time, subsequent application launches will not require set-up.
 - The user will still be asked to confirm the settings.

CVT Menus



CVT Menus

A screenshot of a software interface titled "Local Mode Configuration". The background is a dark, textured image of a celestial body. The interface is a dark gray rectangular box with white text and buttons. It contains a label "Ephemeris Directory", a text input field with the path "C:\Projects\testEphem\2018-10-31", and two buttons labeled "Back" and "Submit".

Local Mode Configuration

Ephemeris Directory

C:\Projects\testEphem\2018-10-31

Back Submit

CVT Menus

Remote Mode Configuration

SFTP Address:

File Path:

Username:

Password:

Demo

Demo Time!

Questions?

- Thank you for your continued support!
- For all CCS communications please contact:

ccs-support@lists.hq.nasa.gov