Application Programming Interface (API)  
To Disseminate NOAA Marine Data & Products

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Application Programming Interface (API) Basics

• Businesses are built on APIs
• A way to serve our developers, third party providers etc.
• A library or server that receives requests and sends responses
• APIs operate as a gateway
  • Provide information (raw data, publications, notices, output from calculations, etc.)
  • Keep unwanted requests out
  • Machine to machine communications
• Client – server model
Client - Server Model

Precision Navigation Concept

- PPU
- Tablet
- Smartphone
- Marine Electronics

API 1
API 2
Server

PC
Smartphone
Laptop
Advantages of Client - Server Architecture

- Easy Maintenance
- Security
- Improved Data Sharing
- Integration of Services
- Data Processing Capability Despite of Location
- Shared Resources amongst different platforms
OCS API Software

- Object-oriented programming in C++
- Server supports multi-threaded architecture
- Communications via sockets using TCP protocol
- Supports 10,000 simultaneous and independent requests

- API currently installed on Amazon Web Services cloud server
- Scalable
- Fast
- Secure
Current API Functions

- Server Functions – Testing
  - Time
  - Server type
- Geodetic Functions – National Geodetic Survey, NOAA
  - Xyz2llh
  - Llh2xyz
  - Geoid12B
  - Xgeoid17
  - Vdatum
  - CORS Rinex data
  - CORS log files
  - CORS position files
Current API Functions

- Navigational Products – Office of Coast Survey, NOAA
  - Nautical charts – PDF
  - Nautical charts – Booklet charts
  - Nautical charts – ENCs
  - Nautical charts – RNCs
  - Notice to Mariners – all chart regions
  - Coast Pilot – 9 regions
  - Vdatum
Current API Functions

• Tides and Water Levels Products – Center for Operational Oceanographic Products and Services, NOAA
  • Water levels
  • Air temperature, wind, water temperature etc.
  • Salinity
  • Currents
  • Datum information
Calling the API - Examples

• Request Nautical Chart in PDF format
  .client 18.217.53.133
  -charts -pdf 12251

• Request Nautical Chart in ENC format
  .client 18.217.53.133
  -charts -enc US5TX12M

• Request Coast Pilot for a region
  .client 18.217.53.133
  -charts -cp [1-9]
  -charts -cp 3
Calling the API - Examples

- **Request CORS RINEX File**
  
  ```
  ./.client 18.217.53.133
  -cors -rinex SSSS YYYY DOY
  -cors -rinex 1lsu 2018 132
  ```

- **Request Geoid12B calculation**
  
  ```
  ./.client 18.217.53.133
  -geoid12B -14.27149304 189.42703
  ```

- **Request Xgeoid17 calculation**
  
  ```
  ./.client 18.217.53.133
  -xgeoid17 64.48739203 194.68377
  ```
Calling the API - Examples

- Request tides and water level information
  ./client 18.217.53.133
  -coops -twl -date 20180810 -station 8454000 -product water_level -application NOAA
  -units metric -time_zone gmt -format json
Under Development

• Output formats
  • JSON
  • XML
  • ASCII
  • Original file format

• Functionality
  • OFS model data
  • Integrated Ocean Observing System (IOOS) data
  • Integrate with Precision Navigation concept
Thank you

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