The Virtual Solar Observatory

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VSO Design Goals

- Utility
- Expansibility, Robustness
- Simplicity
VSO Design Goals

• Utility
  • Unification of distributed data archives
  • Uniform interface for searches and data requests
  • Optional data request logging
VSO Design Goals

• Expansibility & Robustness
  • Multiple data servers and providers
  • Multiple user and application interfaces
  • Minimal centralization of metadata
  • Minimal effort for provider participation; no modifications to existing services
  • No assumed server database architecture
  • Minimal, nearly static information in data registry
VSO Design Goals

- Simplicity
  - No data delivery
  - No centralized data catalogue
  - Simple data model meeting likeliest use criteria
The Virtual Solar Observatory
VSO Status

• Four original testbed servers functioning
• Two new servers in progress, proxy service for one
• API defined, implemented for PERL and Java
• Implementer’s Kit in preparation
• Two instances with various features:
  • [http://vso.stanford.edu/0.6/](http://vso.stanford.edu/0.6/) - beta of full implementation
  • [http://vso.nso.edu/ui.html](http://vso.nso.edu/ui.html) - alpha of extra features
A VSO Interface (0.6)

Search All by Time

a very simple form that automatically searches all data sets registered by all providers for data in the selected time interval.

Search Selected Instruments by Time

performs a joint time-based query on data from selected instruments or archives only.

Search Selected Observables by Time

searches all data sets for data in the selected time interval matching selected criteria for physical observable.

Select Observables, Instruments, and Time

searches selected instrument or archive data sets for data in the selected time interval matching selected criteria for physical observable.

Search Selected Observable/Spectral Range by Time

searches all data sets for data in the selected time interval matching selected criteria for physical observable and/or spectral range.

Comments? Help us improve VSO
VSO Architecture

• Multiple instances manage queries, requests, and returns independently
• Instances run similar core for translation based on registry
• Instances consult registry occasionally
• User or application communicates with VSO instance to query and request
VSO Architecture
(continued)

- Distributed servers communicate via SOAP protocol with each VSO instance
- Distribution of data requests directly through provider interfaces
- Server managers update central registry occasionally
<?xml version="1.0"?>
<definitions name="urn:VSO/VSOi"
    targetNamespace="urn:VSO/VSOi"
    xmlns:typens="urn:VSO/VSOi"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
    xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
    xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
    xmlns="http://schemas.xmlsoap.org/wsdl/">
  <types>
    <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
      targetNamespace="urn:VSO/VSOi">
      <xsd:complexType name="Time">
        <xsd:all>
          <xsd:element name="start" type="xsd:string"/>
          <xsd:element name="end" type="xsd:string"/>
        </xsd:all>
      </xsd:complexType>
      <xsd:complexType name="Wave">
        <xsd:all>
          <xsd:element name="wavemin" type="xsd:float"/>
          <xsd:element name="wavemax" type="xsd:float"/>
          <xsd:element name="waveunit" type="xsd:string"/>
        </xsd:all>
      </xsd:complexType>
    </xsd:schema>
  </types>
</definitions>
Data Provider’s Kit

- PERL installation, if necessary
- Sample registries
  - NSO
  - SDAC
  - ...
- Sample SOAP server
VSO Sample Registry

<xml>
<version> 0.6 </version>
<site> NSO </site>
<contact> Frank Hill </contact>
<uri> http://solarch.tuc.noao.edu/VSO/NSOi </uri>
<proxy> http://solarch.tuc.noao.edu/cgi-bin/VSO/DataProvider/nsoi.cgi </proxy>
<available> 1 </available>
<dataset>
  <source> Evans </source>
  <instrument> spectroheliograph </instrument>
  <physobs> intensity </physobs>
  <wave>
    <wavemin> 6563 </wavemin>
    <wavemax> 6563 </wavemax>
    <waveunit> Angstrom </waveunit>
  </wave>
  <time>
    <start> 19960205 </start>
    <end> 19990528 </end>
  </time>
...