

The Virtual Solar Observatory

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1. and SwRI

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VSO Design Goals

- Utility
- Expansibility, Robustness
- Simplicity

VSO Design Goals

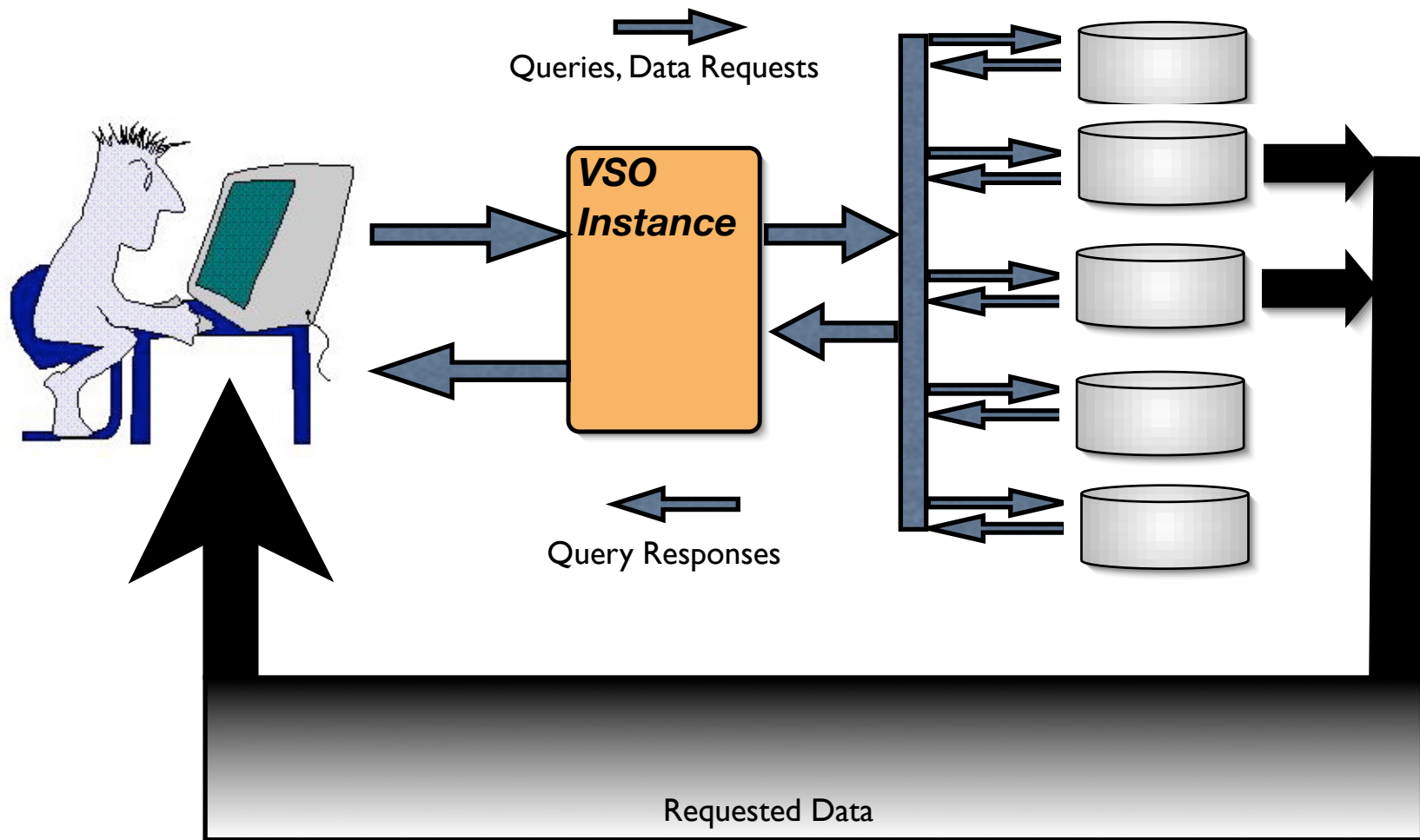
- **Utility**
 - Unification of distributed data archives
 - Uniform interface for searches and data requests
 - Optional data request logging

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



VSO Status

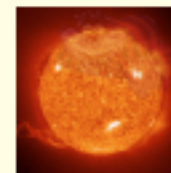
- Four original testbed servers functioning
- Two new servers in progress, proxy service for one
- API defined, implemented for PERL and Java
- Implementer's Kit in preparation
- Two instances with various features:
 - <http://vso.stanford.edu/0.6/> - beta of full implementation
 - <http://vso.nso.edu/ui.html> - alpha of extra features



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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](#)

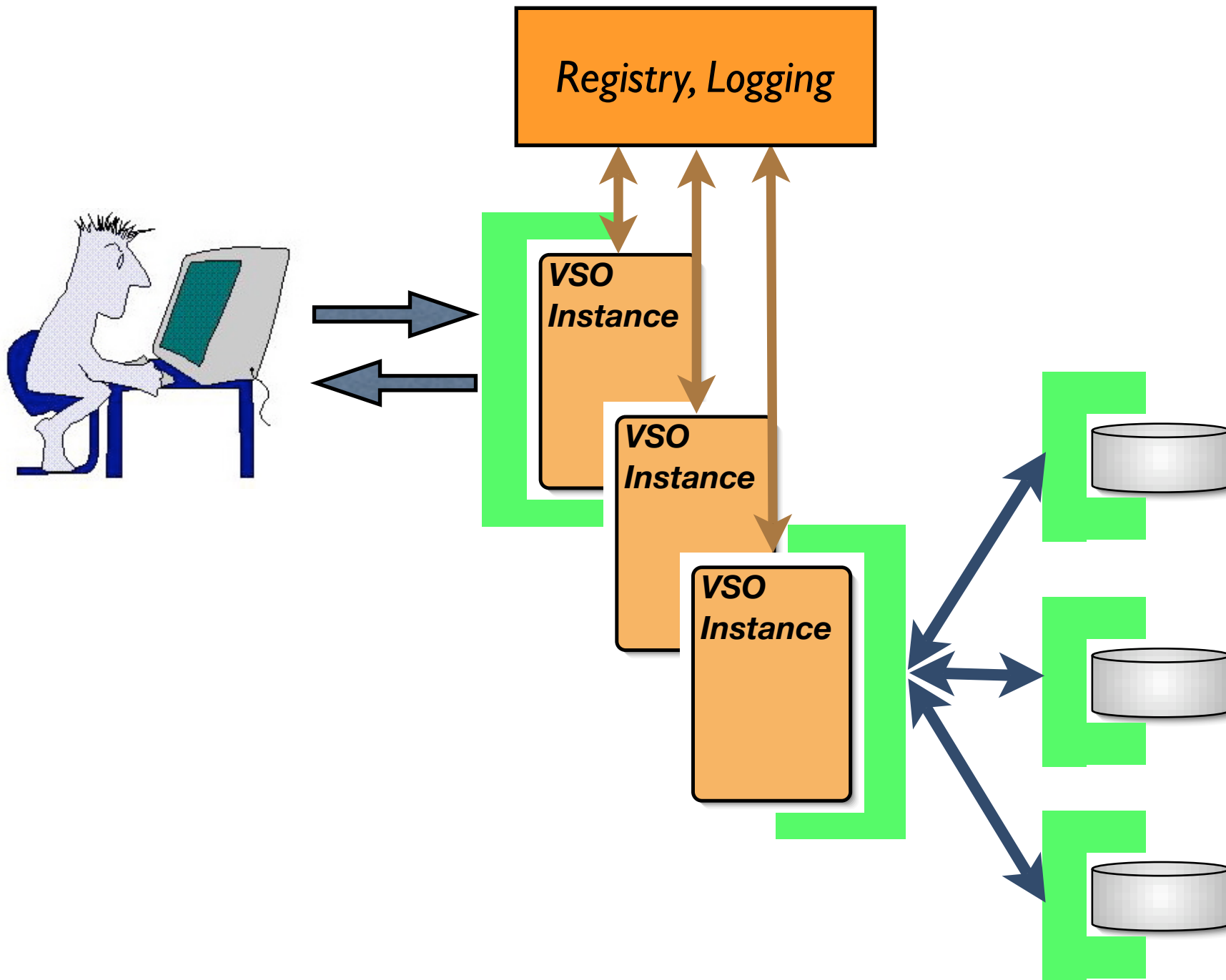
VSO Architecture

- 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



VSO Query WSDL

```
<?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>

```

...

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>
...

```