

Prepared Dan Hennage	No.		
Document responsible/Approved	Date 7/31/05	Rev 1.0	File

# Price Server System 2.0

## Web Service API



Prepared Dan Hennage	No.		
Document responsible/Approved	Date 7/31/05	Rev 1.0	File

# 1 Preface

## 1.1 Purpose, Audience, and Scope

This document describes the Application Programmer Interface (API) to the Price Server System 2.0 Web Service (PSS2WS).

## 1.2 Document Revision History

Doc. Version	Who	Date	Description
0.5	DH	5/19/05	Initial Revision
0.6	DH	6/11/05	Removed WSDL File Text
1.0	DH	7/29/05	Added URL Updated security information

## 1.3 Definitions, Acronyms and Abbreviations

- PSS2 - Price Server System 2.0 ()
- PSS2WS - Price Server System 2.0 Web Service
- Auto-DR - Fully-Automated Demand Response
- EMS - Energy Management System
- Participant – Commercial electricity customer participating in LBNL's research into Auto-DR.
- Participant Client - The software running on a computer at the participant's site.

## 1.4 References

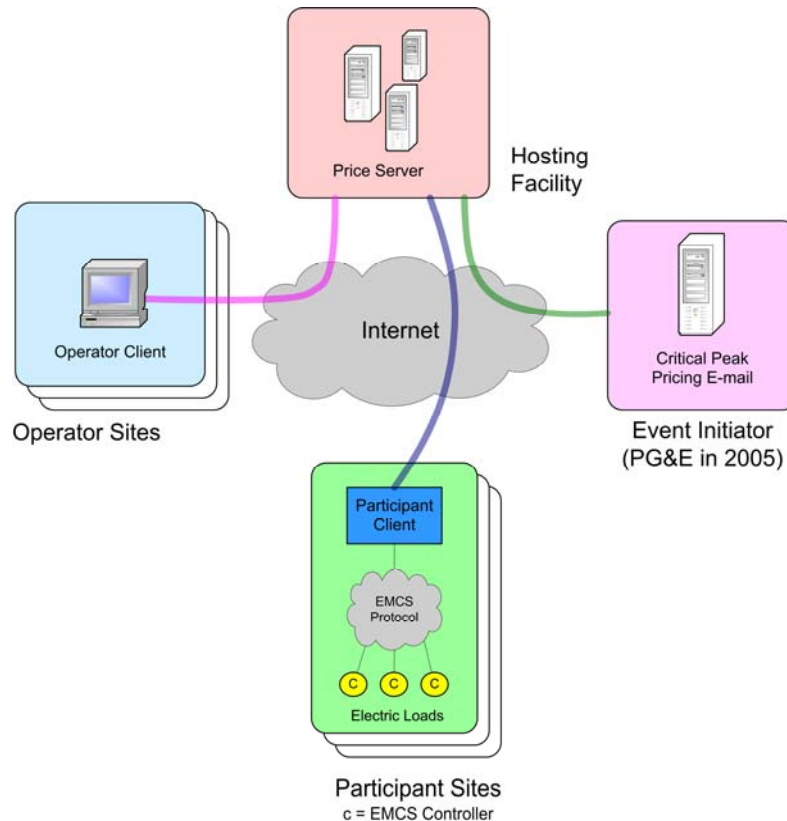
1. Pier Demand Response Research Center Web Site, Automated Facility Demand Response Page, <http://drrc.lbl.gov/drrc-1.html>
2. Simple Object Access Protocol (SOAP), version 1.1, <http://www.w3.org/TR/soap/>
3. Web Service Description Language (WSDL), version 1.1, <http://www.w3.org/TR/wsdl>

Prepared Dan Hennage	No.		
Document responsible/Approved	Date 7/31/05	Rev 1.0	File

## 2 Introduction

The Price Server System 2 (PSS2) delivers electricity pricing information electronically to commercial electricity customers participating in LBNL's research into Fully Automated Demand Response (Auto-DR).

As shown in figure 1, participants will run software (Participant Client) on a computer at their site that communicates with the PSS2 over the Internet using web service technology. This software will also have an interface to the site's energy management system (EMS) to control electric loads based upon pricing information retrieved from the PSS2. Pricing will be set by either a human operator (e.g. LBNL researcher) or an automatic event initiator (e.g. PG&E Critical Peak Pricing system).



**Figure 1: PSS2 System Architecture**

Pricing information sent from the PSS2 to the Participant Client includes the current price of electricity as well the time and value of any change in pricing that will occur in the future.



Prepared Dan Hennage	No.		
Document responsible/Approved	Date 7/31/05	Rev 1.0	File

### 3 Protocol and Discovery

The PSS2WS is an Extensible Markup Language (XML) Web service with a SOAP API. PSS2WS uses SOAP version 1.1 running on top of HTTP or HTTPS.

The PSS2WS does not support any discovery mechanism. LBNL will supply customers with a Web Services Description Language (WSDL) file that defines the Web service based upon the 1.1 version of the WSDL standard.

### 4 URL

<https://localhost:8443/PSS2WS/PSS2WS>

### 5 SOAP Messages

The PSS2WS supports one request/response SOAP message: *getPriceSchedule*. This message serves two purposes:

- Retrieves the current price information. The price information contains the current price as well as a list of changes to the price that will occurring the future.
- Confirms that the previous call to retrieve the price information was successful.

The details of this message are described in the following sections.

#### 5.1 Types

The following types are used in the PSS2WS SOAP messages.

##### 5.1.1 PriceScheduleEntry

The PriceScheduleEntry type represents a change in price at a given time.

Field	Type	Description
date	dateTime	Time when the new price becomes active. UTC.
priceDPKWH	double	New price. \$ per kilowatts hour.



Prepared Dan Hennage	No.		
Document responsible/Approved	Date 7/31/05	Rev 1.0	File

### 5.1.2 PriceSchedule

The PriceSchedule type represents the current price as well as the list of price changes that will occur in the future.

Field	Type	Description
currentPriceDPKWH	double	Current price. \$ per kilowatts hour.
entries	Array of PriceScheduleEntry	Array of PriceScheduleEntry types, each one representing a price change. Sorted by time in ascending order.

## 5.2 Messages

### 5.2.1 getPriceSchedule

Request the current PriceSchedule.

Field	SOAP Type	Description
lastPriceSchedule	PriceSchedule	The PriceSchedule returned from the server in the last call to getPriceSchedule.

### 5.2.2 getPriceScheduleResponse

The response to getPRiceSchedule containing the current price schedule.

Field	SOAP Type	Description
priceSchedule	PriceSchedule	Current PriceSchedule.

## 6 Usage

Participant clients should call getPriceSchedule on the PSS2WS every 60 seconds. To ensure successful delivery of pricing information, there must be a minimum of 50 seconds and a maximum of 300 seconds between calls.



Prepared Dan Hennage	No.		
Document responsible/Approved	Date 7/31/05	Rev 1.0	File

## 7 Security

Access to the PSS2WS is done via SLL to provide server authentication, data encryption, and data integrity. Client authentication is done using HTTP authentication. LBL will provide each participant with a self-signed digital certificate, a username, and a password to use during communications with the PSS2WS.