

What: Develop Common Scheduling Mechanism for Energy Transactions

0.1 Abstract:

The coordination of supply and demand is already of critical importance on the grid; tomorrow, with the increase of distributed energy resources, this coordination becomes more critical. The coordination must involve more than electromechanical coordination; it also involves enterprise activities, home operations and family schedules, and market operations. A common specification, developed for other domains as well as in smart grid, would better support interactions with those other domains and get broader adoption.

0.2 Description:

For human interactions and human scheduling, the well-known ICalendar format is used. There is no equivalent standard for web services. As an increasing number of physical processes are managed by web services, the lack of a similar standard for calendaring of services becomes critical.

The goal of this action plan is to survey the existing specifications for calendaring and develop a standard for how schedule and event information is passed between and within services. The standard should support all of the functionality currently supported by ICalendar for application to the completion of a web service contract.

The scheduling specification will be a micro-specification, and then a micro-standard. A calendar event without associated contract is of little use. The micro-specification can then be incorporated into other specifications through composition, bringing a common scheduling operation to diverse contracts in different domains.

0.3 Objectives:

- Survey work to date and determine short-list precursors.
- Determine plan to expedite development of specifications to standards.
- Develop a plan for cross-referencing schedules and other documents/contracts in a message.

0.4 Why:

One of the most fundamental components of negotiating services is agreeing when something should occur. Short-running services have traditionally been handled as if they were instantaneous, and thereby dodged this requirement through just-in-time requests. Longer-running processes may require significant lead times. When multiple long-running services participate in the same business process, it may be more important to negotiate a common completion time than a common start time. Central coordination of such services reduces interoperability as it requires the coordinating

agent to know the lead time of each service. As we reach out to multiple processes with the span of the grid, coordination must take into account local time zones as well.

A growing number of specifications envision synchronization of processes through broadcast scheduling. The Smart Grid relies on coordinating processes in homes, offices, and industry with projected and actual power availability, including different prices at different times. Weather reports including time are becoming increasingly important to projecting energy availability. Emergency management coordinators wish to inform geographic regions of future events, such as a projected tornado touchdown. These efforts would benefit from a common standard for transmitting calendaring.

Web services are meeting increased acceptance to interact with the low-level [control] systems world. Business systems can interact with building systems using web services specifications, such as oBIX, BACnet/WS, and a number of proprietary specifications including LON-WS, TAC-WS, and others. Energy use in buildings can be reduced while improving performance if building system operation is coordinated with the schedules of the buildings occupants.

Coordination of energy supply and demand requires a common understanding of supply and demand. Future energy markets will see greater variability than today. Consumer interests in green power, parallel markets for energy, and carbon regulations may create increased interest in energy sources. Distributed energy resources introduce new market focuses and new market sources. A scheduling component within energy market operations coordinates both short-lead and long-lead-time activities. This will promote the development of autonomous agents to drive performance while reducing costs for implementation.

0.5 Where:

Coordination is a common component of information exchange across almost every domain. In the evolving transactive power grid market communications will involve energy consumers, producers, transmission and distribution systems, and must enable aggregation for both consumption and curtailment resources. Market makers, such as Independent System Operators (ISOs), Regional Transmission Operators (RTOs), utilities, and other energy services providers. With information in consistent formats, building and facility agents can make decisions on energy production, sale, purchase, and use that fit the goals and requirements of their home, business, or industrial facility.

0.6 How:

- Identify pre-existing work from enterprise domains. The Calendar Consortium(www.calconnect.org) and the ISO20022 financial schedule elements are likely candidates..
- Seek agreement from those who have existing work as to completion, submission as a standard, IP assertions, etc.
- Expedite completion to deliver as component of developing specifications for DR (Energy Interoperation), Market Information (EMIX) and other specifications

- Explore how existing standards for scheduling sequences in BPEL and other well known standards can interact with calendar-oriented standards to solve other problems on the grid.

0.6.1 Task Descriptions

This Project Plan was developed in conjunction with PAP03, Price and Product Definition.

- The Calendar Consortium will complete its current work of XML serialization of ICalendar into a web-service component (WS-Calendar) by the end of 2009, probably within the IETF.
- ISO20022 will comment on and coordinate with the Calendar Consortium and on an agreed upon schedule semantics across enterprise, energy, and financial information.
- Ongoing work in Product Definition (OASIS EMIX) and in grid—end node interactions (OASIS Energy Interoperability) will leave place-holders for a schedule component pending completion of this work.

0.6.2 Deliverables

The Deliverable will be the WS-Calendar standard and associated semantics for schedule performance.

0.7 Who:

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0.8 When:

Task Description	Completion Date
WS-Calendar Specification ready for review:	200912
WS-Calendar Semantic Review completed (ISO 20022, oBIX)	201001
WS-Calendar Incorporated into EMIX:	201004

Illustrative Version