MultiSpeak Version 3.0 Interoperability Assertions

Vendor Neutral Statement of Interoperable Functionality using NRECA's independent laboratory's test harness.

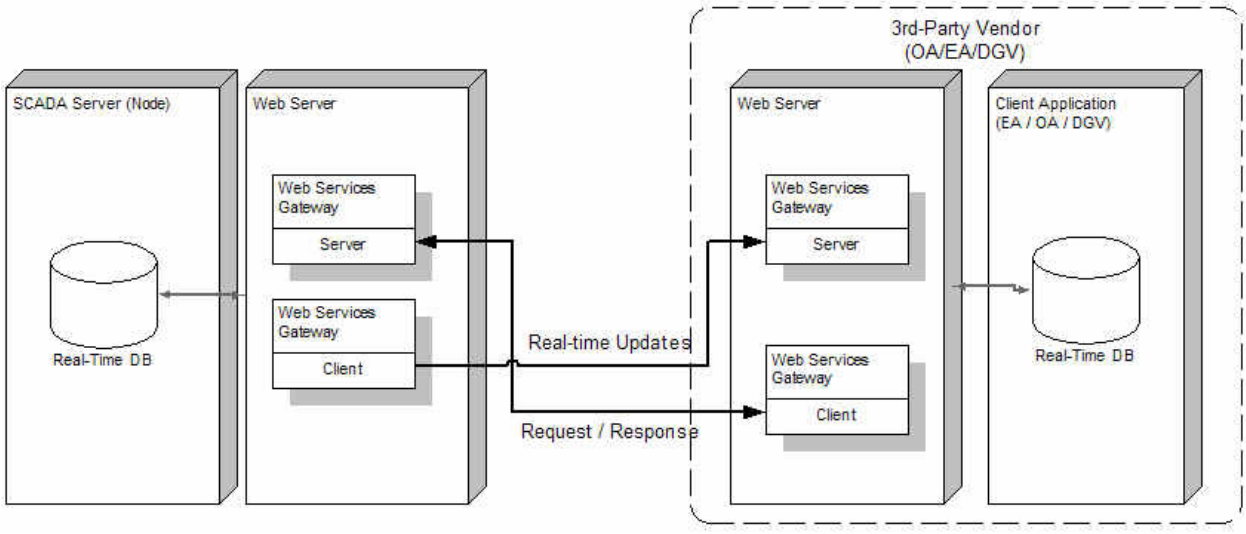
Vendor(s)	Product	Product Version	Role	Batch Interface	Web Client Interfaces	Web Server Interfaces
Advanced Control Systems	PRISM WebService Gateway	1.0	SCADA	-	OA←SCADA DGV←SCADA	SCADA→EA SCADA→OA SCADA→DGV

MultiSpeak® is a specification for the exchange of data between software applications. This standard is developed by the National Rural Electric Cooperative Association (NRECA) to define common interfaces for typical applications used by the electric utilities.

MultiSpeak uses both, web-services and batch methods to facilitate the exchange of data. A web service is an application that can be accessed remotely using the web based Extensible Markup Language (XML). A web service is represented as a Universal Resource Locator (URL) much like a web page, except that it sends and receives information in Simple Object Access Protocol (SOAP) - an XML construct, and the client can be an application instead of a web-browser.

The PRISM WebService Gateway can connect the SCADA PRISM System to either Engineering Analysis (EA), Outage Analysis (OA), and/or Dynamic GIS Viewer (DGV) systems. The MultiSpeak specifications outline a client and server web-service interfaces. The client (EA / OA / DGV) application access the server application in two ways:

1. Request / Response: The (EA / OA / DGV) application client requests information from the SCADA web service server for one or more points. The request for one or all point(s) can be made at any time – for a demand read(s), or for data integrity checks, and can be initiated even when the real-time interface updates are active.
2. Real-Time: The SCADA web service provides the point updates on an exception basis – i.e.: when the value changes in SCADA.



In batch interfaces the application creates XML files that are transferred between the two systems. ACS does not support the batch interface.

Prerequisites for ACS customers:

For this interface to be successfully implemented, a PRISM SCADA device must be configured and enabled for the field device points. The PRISM version must be 8.4.3 or higher. In order to enable a point for the interface the following things must be set.

- A device must be created and assigned for this interface
- An Area of Assignment (AOA) must be associated for this device
- All Points that are to be sent across have to have that AOA set.
- The dead-band and reporting-band should be set to minimize the amount of data sent across the interface for fast changing point values.
- The description field for analog points must contain the MultiSpeak Unit type; the format of this description field as:
  "PointDescripton Delimiter Unit"
  - Point Description is the SCADA Point Description
  - Delimiter by default is the combination of "@(#)", and can be changed for a particular implementation.
  - Unit values are defined by the MultiSpeak standard – please see the standards for up-to-date information.
- LAN connectivity between the systems with a minimum bandwidth of 100Mb/s

Specific Vendor Assertions:

1) When analog values change on a field device, those changed values are sent to the outage management system or map viewing application.

Importance to user: The configuration of field device points is dynamic and controllable for bandwidth and application usage.

How Achieved:
In the above diagram PRISM SCADA receives data from field devices at scan rates. If the point is enabled for the interface, the gateway web client sends the analog or status value to the MultiSpeak compliant web server. Device points can be enabled / disabled dynamically across the interface via the AOA mask; additionally, for fast changing values, the report band for individual points can be throttled at the database level. In small systems with a relatively large number of points, this can be used effectively to reduce network traffic and application bottlenecks.

2) The PRISM WebService Gateway can send all configured points in the SCADA system when requested by the outage management, map viewing or engineering analysis application.

Importance to user: There is no need to pre-map the points that need to be sent across the interface. The SCADA system's administrator can dynamically change the number and type of device points in the real-time database, without stopping SCADA or the interface. This flexibility makes the interface flexible to changing business needs and yet maintaining system up time.

How Achieved: The client (EA / OA / DGV) application can read current analog values and also request current statuses of digital points. Device points can be enabled / disabled dynamically across the interface via the AOA mask without stopping SCADA or the interface.

Products: PRISM WebService Gateway

Summary of Interoperability Test Results
Interface #8 SCADA->EA

Table 1
Recommended MultiSpeak Methods

Method Name	Importance to User	Supported By Server (SCADA)[1]	Supported by Client (EA)[2]	Verified Inter-operable[3]
GetMethods	Requests a list of methods supported by the server.	X		X
PingURL	Verifies that the server is running and reachable.	X		X
GetAllSCADAPoints	Get List Of All SCADA Point Object IDS enabled for the PRISM WebService Gateway	X		X
GetSCADAAnalogBySCADAPointID	Get Value of SCADA Analog for particular point	X		X
GetSCADAStatusBySCADAPointID	Get Value of SCADA Status for particular point	X		X

[1] Supported by Server means that the server has demonstrated in some interoperability test (not necessarily with this client) that it can support the method.
[2] Supported by Client means that the client has demonstrated in some interoperability test (not necessarily with this server) that it can call the method.
[3] Verified Interoperable means that both the client and server have demonstrated in this interoperability test that they can usefully transfer data using this method.

Summary of Interoperability Test Results
Interface #8 SCADA->EA

Table 2
Optional MultiSpeak Methods

Method Name	Importance to User	Supported By Server (SCADA)[1]	Supported by Client (EA)[2]	Verified Inter-operable[3]
GetAllSCADAAnalogs	Get List Of All SCADA Analog Point Object IDS enabled for the PRISM WebService Gateway Note (A)			
GetAllSCADAStatus	Get List Of All SCADA status Point Object IDS enabled for the PRISM WebService Gateway Note (A)			
GetDomainMembers	Get List of the members of a specific domain of information, identified by the domain Name parameter			
GetDomainNames	A list of names of domains supported by the server			
GetModifiedSCADAPoints	Get list of points whose definition changed Note (B)			

A) The GetAllSCADAPoints method provides a single call for ALL analog & status points. Additional calls may only serve to cause excessive network traffic
B) ACS's PRISM SCADA system does not maintain a history of changed points, the system is designed for a memory mapped real-time database

[1] Supported by Server means that the server has demonstrated in some interoperability test (not necessarily with this client) that it can support the method.
[2] Supported by Client means that the client has demonstrated in some interoperability test (not necessarily with this server) that it can call the method
[3] Verified Interoperable means that both the client and server have demonstrated in this interoperability test that they can usefully transfer data using this method

Summary of Interoperability Test Results
Interface #9 SCADA->OA

Table 3
Recommended MultiSpeak Methods

Method Name	Importance to User	Supported By Server (SCADA)[1]	Supported by Client (OA) [2]	Verified Inter-operable[3]
GetMethods	Requests a list of methods supported by the server.	X		X
PingURL	Verifies that the server is running and reachable.	X		X
GetAllSCADAPoints	Get List Of All SCADA Point Object IDS enabled for the PRISM WebService Gateway	X		X
GetSCADAAnalogBySCADAPointID	Get Value of SCADA Analog for particular point	X		X
GetSCADAStatusBySCADAPointID	Get Value of SCADA Status for particular point	X		X

[1] Supported by Server means that the server has demonstrated in some interoperability test (not necessarily with this client) that it can support the method.
[2] Supported by Client means that the client has demonstrated in some interoperability test (not necessarily with this server) that it can call the method.
[3] Verified Interoperable means that both the client and server have demonstrated in this interoperability test that they can usefully transfer data using this method.

Summary of Interoperability Test Results
Interface #9 SCADA->OA

Table 4
Optional MultiSpeak Methods

Method Name	Importance to User	Supported By Server (SCADA)[1]	Supported by Client (OA)[2]	Verified Inter-operable[3]
GetAllSCADAAnalogs	Get List Of All SCADA Analog Point Object IDS enabled for the PRISM WebService Gateway Note (A)			
GetAllSCADAStatus	Get List Of All SCADA status Point Object IDS enabled for the PRISM WebService Gateway Note (A)			
GetDomainMembers	Get List of the members of a specific domain of information, identified by the domain Name parameter			
GetDomainNames	A list of names of domains supported by the server			
GetModifiedSCADAPoints	Get list of points whose definition changed Note (B)			
OutageEventChangedNotification	OA Notifies SCADA of a change in OutageEvent by sending an array of changed OutageEvent objects			

A) The GetAllSCADAPoints method provides a single call for ALL analog & status points. Additional calls may only serve to cause excessive network traffic

B) ACS's PRISM SCADA system does not maintain a history of changed points, the system is designed for a memory mapped real-time database

[1] Supported by Server means that the server has demonstrated in some interoperability test (not necessarily with this client) that it can support the method

[2] Supported by Client means that the client has demonstrated in some interoperability test (not necessarily with this server) that it can call the method.

[3] Verified Interoperable means that both the client and server have demonstrated in this interoperability test that they can usefully transfer data using this method

Summary of Interoperability Test Results
Interface #9 OA->SCADA

Table 5
Recommended MultiSpeak Methods

Method Name	Importance to User	Supported By Server (OA)[1]	Supported by Client (SCADA)[2]	Verified Inter-operable[3]
GetMethods	Requests a list of methods supported by the server.		X	X
PingURL	Verifies that the server is running and reachable.		X	X
SCADAPointChangedNotification	SCADA Notifies OA of changes in SCADA point definitions by sending an array of changed scadaPoint objects. Note (A)			

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A) The SCADA system initializes at startup only, and is memory resident thereafter; subsequent changes to the point definition are not immediately propagated across the interface. If the point exists and definition changed, the next change will have the point definition changes. If the point is added, the client application will have to handle the new point – raise exception, log, or add this point dynamically to the client database. This is by design to prevent unnecessary triggers to be generated that will cause performance issues. ACS recommends a data integrity check at pre-defined times.

[1] Supported by Server means that the server has demonstrated in some interoperability test (not necessarily with this client) that it can support the method
[2] Supported by Client means that the client has demonstrated in some interoperability test (not necessarily with this server) that it can call the method.
[3] Verified Interoperable means that both the client and server have demonstrated in this interoperability test that they can usefully transfer data using this method.

Summary of Interoperability Test Results
Interface #9 OA->SCADA

Table 6
Optional MultiSpeak Methods

Method Name	Importance to User	Supported By Server (OA) [1]	Supported by Client (SCADA)[2]	Verified Inter-operable[3]
SCADAAnalogChangedNotificationByPointID	SCADA Notifies OA of changes in a specific analog value, chosen by scadaPointID		X	X
SCADAStatusChangedNotificationByPointID	SCADA Notifies OA of changes in the status of a specific point, chosen by PointID		X	X
GetActiveOutages	Returns the outageEventIDs for all active outage events			
GetDomainMembers	Get List of the members of a specific domain of information, identified by the domain Name parameter			
GetDomainNames	A list of names of domains supported by the server			
GetOutageEventStatus	Returns the current status of an outage event, given the outage event ID. Note (A)			
GetOutageEventStatusByOutageLocation	Returns the current status of an outage event, given the outage location. Note (A)			
SCADAAnalogChangedNotification	SCADA Notifies OA of changes in analog values by sending an array of changed scadaAnalog objects. Note (A)		X	X
SCADAAnalogChangedNotificationForPower	SCADA Notifies OA of changes in a specific analog value, limited to power analogs. Note (A)			
SCADAAnalogChangedNotificationForVoltage	SCADA Notifies OA of changes in a specific analog value, limited to voltage analogs. Note (A)			
SCADAPointChangedNotificationForAnalog	SCADA Notifies OA of changes in SCADA point definitions, limited to Analog points. Note (A)			
SCADAPointChangedNotificationForStatus	SCADA Notifies OA of changes in SCADA point definitions, limited to Status points. Note (A)			
SCADAStatusChangedNotification	SCADA Notifies OA of changes in point status by sending an array of changed scadaStatus objects. Note (A)		X	X

A) The PRISM SCADA system is a real-time database, and any changes to a status or analog point value are sent to the receiving application instantaneously. . This method is unsupported because of the possibility of causing performance degradation

[1] Supported by Server means that the server has demonstrated in some interoperability test (not necessarily with this client) that it can support the method
[2] Supported by Client means that the client has demonstrated in some interoperability test (not necessarily with this server) that it can call the method
[3] Verified Interoperable means that both the client and server have demonstrated in this interoperability test that they can usefully transfer data using this method

Summary of Interoperability Test Results
Interface #23 SCADA->DGV

Table 7
Recommended MultiSpeak Methods

Method Name	Importance to User	Supported By Server (SCADA)[1]	Supported by Client (DGV)[2]	Verified Inter-operable[3]
GetMethods	Requests a list of methods supported by the server.	X		X
PingURL	Verifies that the server is running and reachable.	X		X
GetAllSCADAPoints	Get List Of All SCADA Point Object IDS enabled for the PRISM WebService Gateway	X		X
GetSCADAAnalogBySCADAPointID	Get Value of SCADA Analog for particular point	X		X
GetSCADAStatusBySCADAPointID	Get Value of SCADA Status for particular point	X		X

[1] Supported by Server means that the server has demonstrated in some interoperability test (not necessarily with this client) that it can support the method.
[2] Supported by Client means that the client has demonstrated in some interoperability test (not necessarily with this server) that it can call the method.
[3] Verified Interoperable means that both the client and server have demonstrated in this interoperability test that they can usefully transfer data using this method.

Summary of Interoperability Test Results
Interface #23 DGV->SCADA

Table 8
Optional MultiSpeak Methods

Method Name	Importance to User	Supported By Server (SCADA)[1]	Supported by Client (DGV)[2]	Verified Inter-operable[3]
GetAllSCADAAnalogs	Get List Of All SCADA Analog Point Object IDS enabled for the PRISM Web Service Gateway. Note (A)			
GetAllSCADAStatus	Get List Of All SCADA status Point Object IDS enabled for the PRISM Web Service Gateway Note (A)			
GetDomainMembers	Get List of the members of a specific domain of information, identified by the domainName parameter			
GetDomainNames	A list of names of domains supported by the server			
GetModifiedSCADAPoints	Get list of points whose definition changed. Note (A)			

A) The GetAllSCADAPoints method provides a single call for ALL analog & status points. Additional calls may only serve to cause excessive network traffic

[1] Supported by Server means that the server has demonstrated in some interoperability test (not necessarily with this client) that it can support the method
[2] Supported by Client means that the client has demonstrated in some interoperability test (not necessarily with this server) that it can call the method
[3] Verified Interoperable means that both the client and server have demonstrated in this interoperability test that they can usefully transfer data using this method

Summary of Interoperability Test Results
Interface #23 DGV->SCADA

Table 9
Recommended MultiSpeak Methods

Method Name	Importance to User	Supported By Server (DGV)[1]	Supported by Client (SCADA)[2]	Verified Inter-operable[3]
GetMethods	Requests a list of methods supported by the server.		X	X
PingURL	Verifies that the server is running and reachable.		X	X
SCADAPointChangedNotification	SCADA Notifies DGV of changes in SCADA point definitions by sending an array of changed scadaPoint objects. Note (A)			

A) The SCADA system initializes at startup only, and is memory resident thereafter; subsequent changes to the point definition are not immediately propagated across the interface. If the point exists and definition changed, the next change will have the point definition changes. If the point is added, the client application will have to handle the new point – raise exception, log, or add this point dynamically to the client database. This is by design to prevent unnecessary triggers to be generated that will cause performance issues.

[1] Supported by Server means that the server has demonstrated in some interoperability test (not necessarily with this client) that it can support the method.
[2] Supported by Client means that the client has demonstrated in some interoperability test (not necessarily with this server) that it can call the method.
[3] Verified Interoperable means that both the client and server have demonstrated in this interoperability test that they can usefully transfer data using this method.

Summary of Interoperability Test Results
Interface #23 SCADA->DGV

Table 10
Optional MultiSpeak Methods

Method Name	Importance to User	Supported By Server (DGV)[1]	Supported by Client (SCADA)[2]	Verified Inter-operable[3]
SCADAAnalogChangedNotificationByPointID	Requests a list of methods supported by the server.		X	X
SCADAStatusChangedNotificationByPointID	Verifies that the server is running and reachable.		X	X
GetDomainMembers	Get List of the members of a specific domain of information, identified by the domain Name parameter			
GetDomainNames	A list of names of domains supported by the server			
SCADAAnalogChangedNotification	SCADA Notifies DGV of changes in analog values by sending an array of changed scadaAnalog objects. Note (A)		X	X
SCADAAnalogChangedNotificationForPower	SCADA Notifies DGV of changes in a specific analog value, limited to power analogs. Note (A)			
SCADAAnalogChangedNotificationForVoltage	SCADA Notifies DGV of changes in a specific analog value, limited to voltage analogs. Note (A)			
SCADAPointChangedNotificationForAnalog	SCADA Notifies DGV of changes in SCADA point definitions, limited to Analog points. Note (A)			
SCADAPointChangedNotificationForStatus	SCADA Notifies DGV of changes in SCADA point definitions, limited to Status points. Note (A)			
SCADAStatusChangedNotification	SCADA Notifies DGV of changes in point status by sending an array of changed scadaStatus objects. Note (A)		X	X

A) The PRISM SCADA system is a real-time database, and any changes to a status or analog point value are sent to the receiving application instantaneously. This method is unsupported because of the possibility of causing performance degradation

[1] Supported by Server means that the server has demonstrated in some interoperability test (not necessarily with this client) that it can support the method
[2] Supported by Client means that the client has demonstrated in some interoperability test (not necessarily with this server) that it can call the method
[3] Verified Interoperable means that both the client and server have demonstrated in this interoperability test that they can usefully transfer data using this method

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Disclaimer:

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