MultiSpeak Version 3.0 Interoperability Assertion

Statement of Interoperable Functionality Between:

Vendor(s)	Product	Product Version	Role	Batch Interface	Web Client Interfaces	Web Server Interfaces
Hunt Technologies Inc.	Command Center	2.2.2	MR			MR→EA
Milsoft Utility Solutions, Inc.	DisSPatch	7.1	EA		MR→EA	
Milsoft Utility Solutions, Inc.	Milsoft Web Server	7.1	EA			EA→MR
Hunt Technologies Inc.	Command Center	2.2.2	MR		EA→MR	
Hunt Technologies Inc.	Command Center	2.2.2	OD			OD→OA
Milsoft Utility Solutions, Inc.	DisSPatch	7.1	OA		OA→OD	
Milsoft Utility Solutions, Inc.	Milsoft Web Server	7.1	OA			OA→OD
Hunt Technologies Inc.	Command Center	2.2.2	OD		OD→OA	
Milsoft Utility Solutions, Inc.	Milsoft Web Server	7.1	OA			OA→MR

Summary:

DisSPatch is an object oriented derived product from Milsoft's Engineering Circuit Model Engine. DisSPatch uses the same WindMil Engineering distribution model as WindMil; therefore DisSPatch is capable of functioning as an EA system and supports all the functions available in the EA interface without the use of Milsoft's WindMil product. DisSPatch is capable of requesting AMR data from Hunt's Command Center using MultiSpeak web services. Assuming consumers in the DisSPatch model are assigned the appropriate meter numbers, DisSPatch can use this interface to determine which of those meters have Hunt AMR endpoints and the type of endpoint each meter has. DisSPatch can request the most recent meter readings or can request the meter data from all AMR supported meters on the system for a single, given day. DisSPatch can request all available interruption information between a given pair of dates.

Imported signal strength and interruption information are visible in DisSPatch's Circuit Element editor and can be displayed graphically using DisSPatch's Color by Custom mode. The signal strength data can be used to determine which customers are with or without power. The phase information is reported as a warning when Milsoft's phase data differs from that of Hunt's. The kW demand data can be stored directly as calculated load and can also be stored as billing

load so that it may be used in a future load allocation operation using WindMil's analysis.

DisSPatch can predict which phase on which device, transformer, and or possible line breaks causing outages and verify restoration based on outage detection events from Hunt's Command Center using the OA-OD interface. Secondary outage predictions occur automatically on AMR meters that fail to report power restoration based on the supplied sensor latency time. DisSPatch can also initiate an outage detection event request in order to validate one or more AMR meters power status.

A Command Center user is able to request meter connectivity information from the Milsoft Web Server via the Endpoint Diagnostic screen within Hunt's Command Center. This meter connectivity information allows Command Center to display upline, downline and sibling meters to the user for diagnostic purposes.

Prerequisites:

For this interface to be useful, the user's electrical system must be modeled to the consumer level in DisSPatch. Each consumer in the DisSPatch model for which meter data is desired must have an associated meter number which corresponds to a meter number in the Command Center software. DisSPatch provides several different ways to import these meter numbers from a billing system, but that dataflow is not part of this interface. Furthermore, Hunt's Command Center must be accessible from the machine on which DisSPatch is running.

Specific Vendor Assertions:

1) DisSPatch can request all AMR supported meters from Command Center

Importance to user: The user can determine which consumers in the DisSPatch model have meters with Hunt AMR endpoints and can determine the type (TS1 or TS2) of each of those endpoints.

How Achieved: The user selects the "Import AMR vendor tags" box in the AMR Data Importer in DisSPatch. When the Run button is clicked, DisSPatch calls the GetAMRSupportedMeters method on the MR-EA interface supported by Command Center. If Command Center reports that a meter is AMR supported, the appropriate AMR type will be visible in DisSPatch on the Consumer Data page of the Circuit Element Editor or displayed graphically with a Hunt Turtle Icon for the consumer having that meter number.

2) DisSPatch can request meter readings from Command Center

Importance to user: The user can retrieve kW demand and/or kWh readings for every AMR supported meter with an associated consumer in DisSPatch and can receive kVAR data from meters that provide it. This load data can be used directly by DisSPatch's engineering analysis functions, or it can be used indirectly to facilitate the allocation of load on the model. The DisSPatch user requests all readings taken by the AMR system on some given day.

In addition to the actual meter readings, Command Center also provides the phase of each meter, its signal strength, and the time of day at which the reading was taken. The phase information can be used to detect modeling errors in the DisSPatch model, and the signal strength may help pinpoint possible voltage problems on the electrical system.

How Achieved: The user selects the "Import AMR meter readings" box in the AMR Data Importer in DisSPatch and then chooses a date in the past for which they would like to receive meter readings. The user selects whether the readings should be imported into calculated load and/or billing load and chooses the appropriate billing load group for the imported data. The user also chooses an assumed power factor to use for meters that do not provide kVAR data. When the Run button is clicked, DisSPatch calls the GetReadingsByDate method on the MR-EA interface supported by Command Center. The returned load data for each meter is stored in the fields the user requested. The signal strength of each meter is visible in DisSPatch on the Consumer Data page of the Circuit Element Editor for the consumer having that meter number. If Command Center reports that a meter has a different phase configuration than is modeled in DisSPatch, DisSPatch generates a warning which gives details about the discrepancy.

Instead of importing meter readings from a given date, the user may choose to import the latest meter readings. In this case the GetLatestReadings method is called instead of GetReadingsByDate.

3) DisSPatch can request interruption data from Command Center

Importance to user: The DisSPatch user can retrieve the total number of interruptions that occurred between a given pair of dates for each AMR supported meter. The DisSPatch user can use this information to verify customer complaints about outages and to inform his assumptions used in reliability analysis.

How Achieved: The user selects the "Import outage events occurring from" box in the AMR Data Importer in DisSPatch and then chooses the pair of dates between which he would like to receive interruption events. When the Run

button is clicked, DisSPatch calls the GetHistoryLogsByDate method on the MR-EA interface supported by Command Center. The returned outage event results for each meter are visible in DisSPatch on the Consumer Data page of the Circuit Element Editor for the consumer having that meter number. The results can be viewed graphically in DisSPatch by using the Color by Custom feature.

4) Command Center can request connectivity information from DisSPatch

Importance to user:
It is useful when identifying distribution trouble spots, which may result in communication issues between an AMR device and substation processing equipment, for the user to review data provided by the AMR system such as signal strength and phase for the device being studied with comparable data for neighboring AMR devices. The meter connectivity information provided by the Milsoft Web Server provides upline, downline and any sibling meter connectivity for the requested meter number.

How Achieved:
Within the Command Center software's Endpoint Diagnostics screen, the user selects the "Click to View" link provided next to "Nearby Meters." A dialog box will open showing any upline, downline and sibling meters along with the most recently reported signal strength, phase and the date reported.

5) Command Center can send outage detection events to the Milsoft Web Server

Importance to user:
Command center sends unsolicited outage detection events in order for DisSPatch to predict outages and confirm restoration.

How Achieved:
The command center automatically monitors AMR endpoints and sends any outage status changes to the OA server.

Products: DisSPatch and Command Center

Summary of Interoperability Test Results
Interface #4
MR→EA

Table 1
Recommended MultiSpeak Methods

Method Name	Importance to User	Supported by Server[1] (MR)	Supported by Client[2] (EA)	Verified Inter-operable[3]
GetMethods	Requests a list of methods supported by the server.	X	X	X
PingURL	Verifies that the server is running and reachable.	X	X	X
GetAMRSupportedMeters	Requests a list of all AMR supported meters.	X	X	X
GetLatestReadingsByMeterNo	Requests the most recent meter reading for a given meter.	X		
GetLatestReadings	Returns the most recent readings for all AMR supported meters.	X	X	X
GetReadingsByDate	Requests all meter readings taken between two dates.	X	X	X
GetReadingsByMeterNo	Returns all readings for a given meter taken between two dates.	X		

Table 2
Optional MultiSpeak Methods

Method Name	Importance to User	Supported by Server[1] (MR)	Supported by Client[2] (EA)	Verified Inter-operable[3]
GetDomainMembers	Requests the members of a given domain (type of fixed information, such as all of the counties in the database).			
GetDomainNames	Requests the domains (lists of fixed information, such as the counties served, or the acceptable statusCodes for this installation).			
GetHistoryLogByMeterNo	Requests data about meter events for a specific meter.	X		
GetHistoryLogsByDate	Requests all outage events occurring between two dates.	X	X	X
GetHistoryLogsByDateAndEventCode	Requests data about meter events for a specific event type and date range.	X		
GetHistoryLogsByMeterNoAndEventCode	Requests data about meter events for a specific meter and date range.	X		
GetModifiedAMRMeters	Requests changes in AMR meters since a specific data exchange session.			
GetReadingsByUOMAndDate	Requests all meter readings taken between two dates for a specific type of reading (UOM = unit of measure, e.g. kW).			

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.

Products: Milsoft Web Server and Command Center

Summary of Interoperability Test Results
Interface #4
EA → MR

Table 3
Recommended MultiSpeak Methods

Method Name	Importance to User	Supported by Server[1] (EA)	Supported by Client[2] (MR)	Verified Inter-operable[3]
GetMethods	Requests a list of methods supported by the server.	X	X	X
PingURL	Verifies that the server is running and reachable.	X	X	X

EA → MR

Table 4
Optional MultiSpeak Methods

Method Name	Importance to User	Supported by Server[1] (EA)	Supported by Client[2] (MR)	Verified Inter-operable[3]
GetAllCircuitElements	Returns all circuit elements.	X		
GetChildCircuitElements	Returns circuit elements immediately fed by the given line section or node (eaLoc)	X		
GetDomainMembers	The client requests from the server a list of names of domains supported by the server			
GetDomainNames	Requests the domains (lists of fixed information, such as the counties served, or the acceptable statusCodes for this installation).			
GetDownlineCircuitElements	Returns all circuit elements downline from the given circuit element	X		
GetDownlineMeterConnectivity	Returns the meter connectivity for all meters down line from a given meter	X	X	X
GetModifiedCircuitElements	Returns all circuit elements that have been modified since the previous session identified	X		
GetParentCircuitElements	Returns circuit elements immediately upstream of the given line section or node (eaLoc).	X		
GetSiblingMeterConnectivity	Returns all meters on the same transformer as the given meter.	X	X	X
GetSubstationNames	Returns all substation names	X		
GetUplineCircuitElements	Returns circuit elements in the shortest route to source from the given line section or node (eaLoc).	X		
GetUplineMeterConnectivity	Returns all meters from the first up line distribution transformer.	X	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.

Products: Milsoft Web Server and Command Center

Summary of Interoperability Test Results
Interface #5
OA → OD

Table 5
Recommended MultiSpeak Methods

Method Name	Importance to User	Supported by Server[1] (OA)	Supported by Client[2] (OD)	Verified Inter-operable[3]
GetMethods	Requests a list of methods supported by the server.	X	X	X
PingURL	Verifies that the server is running and reachable.	X	X	X
ODEventNotification	Notifies a change in outage detection events	X	X	X

Table 6
Optional MultiSpeak Methods

Method Name	Importance to User	Supported by Server[1] (OA)	Supported by Client[2] (OD)	Verified Inter-operable[3]
GetActiveOutages	Returns the outage Event IDs for all active outage events.	X		
GetAllCircuitElements	Returns all circuit elements.	X		
GetChildCircuitElements	Returns circuit elements immediately fed by the given line section or node (eaLoc).	X		
GetDomainMembers	The client requests from the server a list of names of domains supported by the server.			
GetDomainNames	Requests the domains (lists of fixed information, such as the counties served, or the acceptable statusCodes for this installation).			
GetDownlineCircuitElements	Returns all circuit elements downline from the given circuit element.	X		
GetDownlineMeterConnectivity	Returns the meter connectivity for all meters down line from a given meter	X	X	X
GetModifiedCircuitElements	Returns all circuit elements that have been modified since the previous session identified	X		
GetOutageEventStatus	Returns the current status of an outage event, given the outage event ID.	X		
GetOutageEventStatusByOutageLocation	Returns the current status of an outage event, given the outage location.	X		
GetParentCircuitElements	Returns circuit elements immediately upstream of the given line section or node (eaLoc).	X		
GetSiblingMeterConnectivity	Returns all meters on the same transformer as the given meter.	X	X	X
GetSubstationNames	Returns all substation names	X		
GetUplineCircuiteElements	Returns circuit elements in the shortest route to source from the given line section or node (eaLoc).	X		
GetUplineMeterConnectivity	Returns all meters from the first up line distribution transformer.	X	X	X
ODDeviceChangeNotification	Notifies of a change in outage detection events	X		

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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.

Products: DisSPatch and Command Center
Summary of Interoperability Test Results
Interface #5
OD → OA

Table 7
Recommended MultiSpeak Methods

Method Name	Importance to User	Supported by Server[1] (OD)	Supported by Client[2] (OA)	Verified Inter-operable[3]
GetMethods	Requests a list of methods supported by the server.	X	X	X
PingURL	Verifies that the server is running and reachable.	X	X	X
GetAllOutageDetectionDevices	Returns all Outage Detection Devices.			
GetOutageDetectionDevicesByMeterNo	Returns an Outage Detection Device Associated with the Given Meter Number.			

Table 8
Optional MultiSpeak Methods

Method Name	Importance to User	Supported by Server[1] (OD)	Supported by Client[2] (OA)	Verified Inter-operable[3]
CancelODMonitoringRequestByObject	Cancel outage detection monitoring on the list of supplied circuit elements.			
DisplayODMonitoringRequests	Requests a list of circuit elements being monitored.			
GetDomainMembers	Requests the members of a given domain (type of fixed information, such as all of the counties in the database).			
GetDomainNames	Requests the domains (lists of fixed information, such as the counties served, or the acceptable status codes for this installation).			
GetOutageDetectionDevicesByStatus	Returns all outage detection devices with a given status.			
GetOutageDetectionDevicesByType	Returns all outage detection devices with a given type			
GetOutagedODDevices	Returns the outage detection devices that are currently experiencing an outage.			
InitiateODEventRequestByObject	Initiates an outage detection event request on service locations experiencing an outage downline from a circuit element.			
InitiateODMonitoringRequestByObject	Initiates an outage detection monitoring request on service locations downline from a circuit element at a given time interval.			
InitiageOutageDetectionEventRequest	Initiates an outage detection event request on the list of meter numbers.	X	X	X
ModifyODDataForOutageDetectionDevice	Allow OA to Modify OD data for a specific Outage Detection Device object.			

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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.

Products: Milsoft Web Server and Command Center

Summary of Interoperability Test Results
Interface #27
OA → MR

Table 9
Recommended MultiSpeak Methods

Method Name	Importance to User	Supported by Server[1] (OA)	Supported by Client[2] (OD)	Verified Inter-operable[3]
GetMethods	Requests a list of methods supported by the server.	X	X	X
PingURL	Verifies that the server is running and reachable.	X	X	X
GetOutageEventStatus	Returns the current status of an outage event, given the outage event ID.	X		

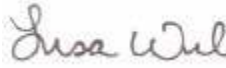
Table 10
Optional MultiSpeak Methods

Method Name	Importance to User	Supported by Server[1] (OA)	Supported by Client[2] (OD)	Verified Inter-operable[3]
GetActiveOutages	Returns the outage Event IDs for all active outage events.	X		
GetDomainMembers	The client requests from the server a list of names of domains supported by the server.			
GetDomainNames	Requests the domains (lists of fixed information, such as the counties served, or the acceptable statusCodes for this installation).			
GetOutageEventStatusByOutageLocation	Returns the current status of an outage event, given the outage location.	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.

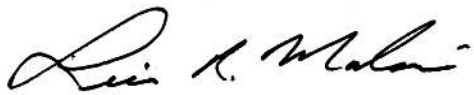
Certified by:

For Hunt Technologies, Inc.:



Software Program Manager
Name: Lisa Williams
Date: January 23, 2006

For Milsoft Utility Solutions, Inc.:



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Assertions Verified by:

Name: Hannu Huhdanpaa
UISOL, Inc.
Testing Agent
Date: January 23, 2006

Disclaimer:

The assertions made in this document are statements of the vendors offering the two products listed above. The Testing Agent has observed the software performing the tasks described in these vendor assertions.

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