



ICD Wiki – Framework for Enabling Semantic Web Service Definition and Orchestration

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Net-Centric Integration

- Web Services
 - Net-Centric architecture is typically implemented by a loosely-coupled service oriented architecture (SOA)
 - SOAs are usually implemented using Web Service technology
 - Standard web-based interface protocol
 - Web Services can be combined together to meet a complex business need
- Integration of Web Services
 - Generation of Composite Web Services typically requires Systems Integrators and Software Developers to manually connect disparate web services together
 - As the number of Web Services grow in the enterprise (wrapping legacy systems, new capabilities), the desire to create customized Composite Services will grow

Net-Centric: Participating as a part of a continuously- evolving, complex community of people, devices, information and services interconnected by a communications network to achieve optimal benefit of resources and better synchronization of events and their consequences (Wikipedia, The Free Encyclopedia)

We never forget who we're working for ®



IntegrationWare IRAD

- Research Objective
 - To design and prototype a framework that allows users to easily create Composite Services through a Web 2.0-inspired drag and drop paradigm. The framework will determine how (or if) the services can be connected to create the new Composite Service.

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Major Components

- Semantic Web Services
 - Semantically relate web service interfaces to a set of ontology models
- ICD Wiki (Interface Control Document)
 - Provides a familiar and intuitive tool to document service interfaces.
 - Makes modern-day static ICDs obsolete by facilitating dynamic system integration
- Service Composition
 - Leverage the semantic annotations to allow users to link services together and automatically create Composite Services

Focus on Interfaces/Data Structures, not Data



Mapping Completed by User as Part of Ingest Process

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Generated Composite Service





Why use a Wiki?

Document Web Service Description in Human-Managed Format

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- Interface Description (operation description, parameter inputs/ outputs, definition of each input/output (based on ontology model mapping), unit for each input/output, data format for each input/ output)
- Security/Role Access (who can access the service & underlying data, security model)
- Provenance Information (service organization creator, data accessed (description with source info), algorithms executed,...)
- Governance Information (quality of service, service deployment history, service change history, service versions deployed,...)
- User Feedback of Service
 - Allows users to comment and provide feedback on service utilization and quality
- Collaborative Ontology Model Development/Management
 - Import existing ontology model into ICD wiki
 - Allow users to comment on ontology model



ICD Wiki Page Samples

Log in / create accour page discussion edit history Ware getAssetOverview (http://new.webservice.namespace) Semantic Predicate Service Contents [hide] Object Integration 1 Operation Details Log in / create account 2 Technical Operation Description special Set \$wgLogo 2.1 Innuts navigation to the URL 2.2 Outputs Main Page path to your WSDL Connections Models Community portal own logo -**Operation Details** Current events Select Model: STRUCTURALMODEL 🗸 Interfaces image. Recent changes Faults Name: getAssetOverview http://iware.irad.lmco.com/Structural#Owner Random page Operations Operation Created Date: 10/21/2008 http://iware.irad.lmco.com/Structural#Coordinate Help navigation Operation: {http://iware.irad.Imco.com/services/ReverseGeocodeService}getAddress Donations http://iware.irad.lmco.com/Structural#WGS84Co Operation Owner: D. D. Brown Main Page Messages Domain: http://iware.irad.lmco.com/Structural#h Description: This service takes in an ISR Asset Owner and returns detailed information Community portal search Input, Element: {http://iware.irad.lmco.com/schemas/ReverseGeocodeTypes}positio Domain: http://iware irad Imco.com/Structural#t the Asset Owner; including the asset description (id, name, type, location) and senso Current events Tag: element, Name: {http://iware.irad.lmco.com/schemas/ReverseGeocodeTypes}position, Type: {h Domain: http://iware.irad.lmco.com/Structural#h Recent changes System: Persistent Automation Tag: element, Name: {http://iware.irad.lmco.com/schemas/ReverseGeocodeTypes}latitude, Type: Random page Domain: http://iware.irad.lmco.com/Structural# Go Search Quality: Excellent (8.2 out of 10) Help Tag: element. Name: {http://ware.irad.lmco.com/schemas/ReverseGeocodeTypes}longitude. Type http://iware.irad.lmco.com/Structural#Structure Donations Output, Element: {http://iware.irad.lmco.com/schemas/ReverseGeocodeTypes}address toolbox http://iware.irad.lmco.com/Structural#Bridge **Technical Operation Description** Tag: element, Name: {http://iware.irad.lmco.com/schemas/ReverseGeocodeTypes}address, Type; { http://iware.irad.lmco.com/Structural#Building What links here search ware.irad.lm Domain: http://iware.irad.lmco.com/Structural#ha Related changes Parent Service = Service~http://new.webservice.namespace Tag: element. Name: {http://iware.irad.lmco.com/schemas/ReverseGeocodeTypes}city. Type: {http://www.irad.lmco.com/schemas/ReverseGeocodeTypes}city. Domain: http://iware.irad.lmco.com/Structural#ha Upload file Go Search Tag: element, Name: {http://iware.irad.lmco.com/schemas/ReverseGeocodeTypes}state, Type: {ht http://iware.irad.lmco.com/Structural#Location Special pages Inputs Tag: element, Name: {http://iware.irad.lmco.com/schemas/ReverseGeocodeTypes}zip, Type: {http http://iware.irad.lmco.com/Structural#AddrLocati Printable version oolbox String Fault Messages Domain: http://iware.irad.Imco.com/Structural# Permanent link Log in / create accou Domain: http://iware.irad.lmco.com/Structural#h page discussion edit history OAF Domain: http://iware.irad.lmco.com/Structural#h Output http://iware.irad.lmco.com/Structural#PositionLoc ïWare AssetInfo Array (http://new.webservice.namespace) Domain: http://iware.irad.lmco.com/Structural# Ac Predicate Object Service Integration AssetInfo Array is a collection of AssetInfo objects. asElement assetinfo asName AssetInfo Array avigation Complex Type Components ComplexTypeClass [edit] type Main Page Community portal AssetInfo AssetInfo_Arra This pa Current events Recent changes Random page Element Model Element Nam Help Reference Туре Donations ssetinfoArray earch MediaWiki sensorArray Sensors Array Assetinfo_Arra Go Search Structure assetType string ComplexTypeCla oolbox Coordinate What links here assetType Related changes Upload file assetName assetinfo string Special pages Printable version assetStatus Permanent link assetDescription string Assetinfo assetid assetId string MXGraph assetStatus string assetNam AddrLocation Accetion

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ICD Wiki – End State Architecture

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