



# ActiveVOS

## Standards Support

**AN ACTIVE ENDPOINTS TECHNICAL NOTE**

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## Introduction

ActiveVOS empowers line-of-business project teams to create composite and service-oriented business process management (BPM) applications incorporating people, processes and services using industry standards.

With ActiveVOS, you can design, develop, deploy and maintain composite business applications as never before -- without writing code and in a 100% standards-based environment. ActiveVOS visually incorporates people, processes and services into an easily tested and easily maintained composite BPM applications.

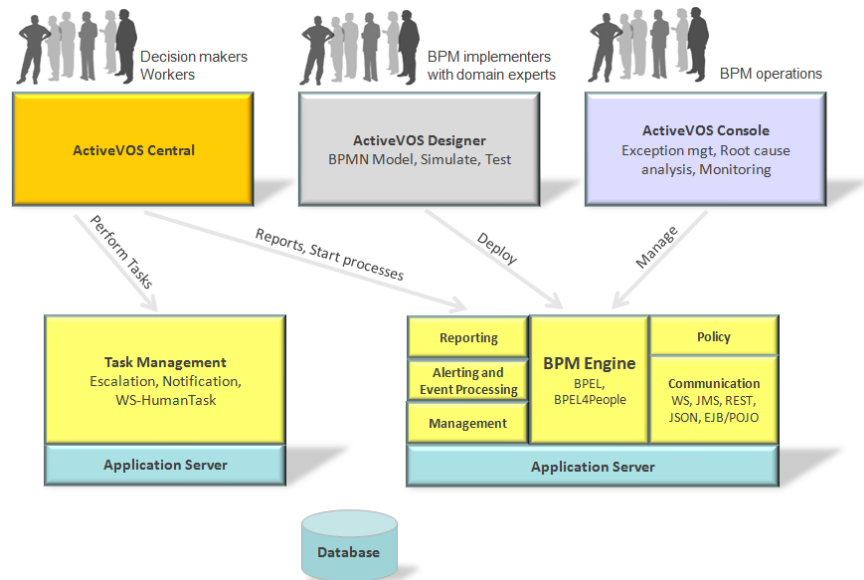
Unlike proprietary alternatives, ActiveVOS does not require users to deploy a major new application infrastructure as it leverages the platforms you have today. ActiveVOS is platform independent. ActiveVOS is uniquely capable of integrating all of your existing service assets and processes into a unified, flexible service-oriented and standards-based application fabric.

ActiveVOS uses various standards including the OMG's Business Process Management Notation (BPMN), and OASIS's Business Process Execution Language (WS-BPEL), BPEL Extensions for People (BPEL4People) and WS-Human Task standards. These standards offer businesses the means by which to implement standards-based BPM application.

This document describes the use of standards offered by ActiveVOS. The document first describes ActiveVOS and its components to help readers get situated with respect to where a standard applies. It then describes, by functional area, the use of standards in relation to its field of use.

## ActiveVOS Components

ActiveVOS is comprised of multiple components. Each has a role to play in terms the function it carries out and when it does so as part of the composite business service and application lifecycle. These components are depicted here.



### ActiveVOS Designer

ActiveVOS Designer is a rich productivity tool that incorporates the BPMN, BPEL and BPEL4People standards, and optimized and highly usable tooling that make easy it to create orchestrations quickly. And because those BPM applications are based on standards, enterprises' business logic is freed from proprietary workflow engines. ActiveVOS Designer helps you rapidly create standards-based applications.

ActiveVOS Designer facilitates the following:

- It makes it easy for architects, business analysts and developers to work collaboratively and approachable for business end users with whom they need to interact. It achieves this by offering the latest BPMN notation for modeling and implementing business processes.
- It exposes the full power of BPMN enabling designers to control every aspect of the diagram. ActiveVOS's BPMN designer promotes modeling best practices while being significantly easier

to use. Structured activities can be dragged and dropped from the ActiveVOS Designer palette onto the canvas, significantly reducing the amount of time required to model a BPEL process.

- It generates executable BPEL processes that orchestrate human activity and services using a combination of BPEL and the BPEL Extensions for People (BPEL4People).
- It allows users to perform service discovery and provides the ability to manage service references to help users deal with changes of service definitions.
- It orchestrates services defined using WSDL interfaces. Or, it allows designers to start with XML schema or XML fragments if this is all that is available to start with.
- It incorporates non-Web service-based assets through a Web Services Definition Language (WSDL) interface façade enabling designers to leverage existing JMS, REST, EJB and Java based assets. As such these are used as if they were services, each having a distinctive binding.
- It simulates processes locally or using remote debugging, allowing designer to save simulations and test data, which can then be used to generate unit tests and test suites to perform scenario testing.
- Use wizard-based, push-button deployment to deploy new orchestrations and updates to the server.

### ActiveVOS Server

ActiveVOS Server has been built to support non-stop operation of composite business applications. With ActiveVOS Server you can:

- Configure and enforce runtime behavior of an orchestration using standard policies
- Perform server-based runtime message correlation and handle service communication retries to free the developer from runtime concerns

- Perform endpoint management to make it easy to deploy an orchestration from one environment to another, or deal with a change in topology
- Suspend a running process using process exception management capabilities built into the ActiveVOS Console to handle bad data which would otherwise have unnecessarily failed a transaction, and correct the problem via remote debugging
- Monitor server activity and set performance thresholds for notification
- Deploy a new version of a process and control when it is activated and if running processes need to be automatically migrated to the new version

### **ActiveVOS WS-HumanTask Service**

A distinct component of ActiveVOS Server is its task management service responsible for task management, task escalation and notification management. It exposes its service through the OASIS WS-HumanTask Web service API using both a SOAP and a JSON binding to various types of WS-HumanTask clients.

### **ActiveVOS Central**

As process-driven human tasks become an increasingly common part of day-to-day work, the ability to link these tasks with the request that initiated them becomes more important. Having the ability to look up progress for ongoing work is equally important. When reviewing tasks, it is also likely that work might need to be initiated for others to carry out. And, it is necessary to be able to see reports that detail status and throughput. In other words, as process applications become more and more common, users need a central place to interact with these business processes, to check on their status and to manage additional work that processes may require.

To meet these needs, ActiveVOS includes ActiveVOS Central – a rich Internet application - that consolidates in one place the ability to initiate processes via forms or perform lookups for status of a request, carry out tasks, and access reports to help users and managers better manage work. ActiveVOS Central's task list is a WS-HumanTask client.

## Broad Standards Support

ActiveVOS supports a broad set of standards summarized here and described in this document.

### Process Modeling Notation

- OMG BPMN 2.0

### Process Implementation

- OASIS WS-BPEL 2.0 Standard (also supports BPEL 1.1)
- OASIS Contributed WS-Human Task 1.0 Specification
- OASIS Contributed BPEL Extensions for People 1.0 Specification

### Interface/Definition

- WSDL 1.1, XML Schema 1.0, XPATH, XQUERY, XSLT, JavaScript

### Protocols

- SOAP 1.1/1.2 over HTTP/HTTPS
- SOAP/Plain XML over JMS
- REST
- JSON
- EJB
- WS-Reliable Messaging

### WS-I Basic Profile

### Security and Authentication

- WS-Security
- SAML 1.1
- LDAP v3

### Governance

- WS-Policy

### Discovery

- UDDI v2, v3
- WSIL

### Management/Monitoring

- WS-Distributed Management

## People, Processes and Services

ActiveVOS delivers the ability to integrate people, processes and services by leveraging WS-BPEL for process integration, WS-BPEL Extensions for People to incorporate human activity in a process, and WS-Human Task for creating and management human tasks and notifications.

Services, be they exposed as SOAP, REST, JMS, EJB and Java classes are exposed to ActiveVOS as a Web service thereby eliminating the binding details to the underlying technology that implements these “services.”

### BPMN

Business Process Management Notation (BPMN 2.0) is a standard completing development by the OMG’s [Business Process Management Initiative \(BPMI\)](#). The primary goal of the BPMN effort was to provide a notation that would be readily understandable by all business users, from the business analysts who create the initial drafts of the processes, to the technical developers responsible for implementing the technology that will perform those processes, and finally, to the business people who will manage and monitor the processes.

BPMN is supported with an internal model that allows executable BPEL. Thus, BPMN creates a bridge between business process modeling and BPEL-based business process execution. ActiveVOS Designer and ActiveVOS Console use BPMN 2.0.

### WS-BPEL

The WS-BPEL (Web Services Business Process Execution Language) is the Web Services orchestration standard from OASIS. It defines a portable execution format that relies exclusively on Web service resources and XML data. BPEL is used for creating composite business applications in SOA.

[WS-BPEL 2.0](#) became an [OASIS standard in April 2007](#). ActiveVOS fully supports WS-BPEL 2.0 and provides full backward compatibility with BPEL 1.1 in both the ActiveVOS Designer and the ActiveVOS Server.

## People and Human Tasks

There are two key specifications for Web service-based human interaction:

- OASIS Contributed WS-Human Task 1.0 Specification
- OASIS Contributed BPEL Extensions for People 1.0 Specification

Active Endpoints co-authored these specifications with Adobe, BEA, IBM, Oracle and SAP AG. These specifications were submitted to OASIS in January 2008. The work has on these specifications will be completed by the [OASIS WS-BPEL Extension for People \(BPEL4People\) technical committee](#) in March 2010.

The specifications are fully implemented with the exception of Constellation 3 and 4.

## Interfaces and Protocols

ActiveVOS provides rich support for SOA interfaces and protocols. This is a natural result of supporting standards at its core.

BPEL is layered on top of and extends the WSDL definition model. Thus WSDL defines the specific service interfaces that are used to interact with a number of implementation types (e.g. Web services, REST, JSON, JMS, and Java/EJB).

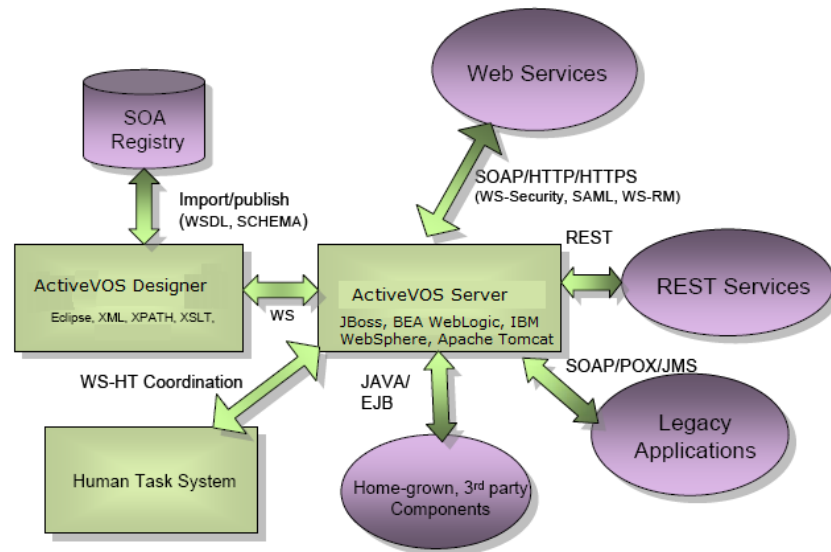


BPEL defines how WSDL interfaces are composed to achieve a business goal and further specifies extensions to WSDL in support of long-running asynchronous conversations.

As a core SOA standard, BPEL utilizes in turn other SOA related technologies and standards –XML Schema, XPATH, Javascript, XSLT and WS-Addressing.

BPEL consumes and produces WSDL defined services. It therefore fits naturally in a Web service enabled infrastructure. That being said Web services although growing in numbers only represent a portion of the “services” exposed by enterprises.

ActiveVOS supports the need to be inclusive with heterogeneous systems by providing a standards and open manner to integrate disparate systems as shown below.



To meet the need of the above depiction ActiveVOS supports the following interface and protocol standards, technologies, and profiles:

## Interface and Definitions

- WSDL 1.1
- XML Schema 1.0
- Expression languages: XPATH, XQUERY, JavaScript
- WS-Addressing
  - WS-Addressing (March 2003)
    - `xmlns:wsa=http://schemas.xmlsoap.org/ws/2003/03/addressing`
  - WS-Addressing (March 2004)
    - `xmlns:wsa=http://schemas.xmlsoap.org/ws/2003/03/addressing`
  - WS-Addressing (August 2004)
    - `xmlns:wsa=http://schemas.xmlsoap.org/ws/2004/08/addressing`
  - WS-Addressing 1.0
    - `wsa=http://www.w3.org/2005/08/addressing`

## Protocols

- SOAP 1.1/1.2 over HTTP/HTTPS
- SOAP/Plain XML over JMS 1.1

- REST
- JSON
- JAVA POJO and EJB
- WS-Reliable Messaging 1.0
  - WS-ReliableMessaging (February 2005)
    - xmlns:wsmr = <http://schemas.xmlsoap.org/ws/2005/02/rm>
  - WS-ReliableMessaging Policy (February 2005)
    - xmlns:wsrmp= <http://schemas.xmlsoap.org/ws/2005/02/rm/policy>

### WS-I Basic Profile

- WS-I Basic Profile V1.1
- WS-I Basic Security Profile V1.0

## Security and Authentication

### WS-Security Standards

ActiveVOS supports the following WS-Security V1.0 (WSSE) profiles and standards:

- OASIS: Username Token Profile V1.0 (Jan 2004)
- OASIS: X.509 Token Profile V1.0 (Jan 2004)
- OASIS: SAML Token Profile V1.0 (Jan 2004)
- W3C Recommendation: Canonical XML Version 1.0 (March 2002)
- W3C Working Draft: XML Encryption Syntax and Processing (March 2002)
- W3C Recommendation: XML Signature Syntax and Processing (February 2002)

## SAML 1.1

ActiveVOS supports SAML 1.1 and gives users the option to use a declarative approach within the deployment descriptors to specify how to generate and consume messages containing SAML Assertions.

ActiveVOS conforms to:

- SAML1.1: SOAP over HTTP binding specified in the oasis-sstc-saml-conform-1.1.pdf document produced by the OASIS Security Technical Committee.
- SAML 1.1 section of the WS-I Basic Security Profile 1.1

ActiveVOS supports:

- Participation as a relying party in a trust relationship based on SAML
- Ability to produce, validate, and verify SAML 1.1 assertions with both holder-of-key or sender-vouches confirmation methods

## LDAP v2/v3

LDAP v2 and v3 are supported as an identity provider and for purpose of authentication.

## Supported Tokens, Algorithms & Identifiers

The following are supported

- Supported Token Types
  - Username Token
  - SAML Token 1.1
  - X.509 Token
    - **Direct Binary Reference** – (send & receive) Preferred method, used where possible.
    - **Issuer Serial** - (send & receive) Preferred external reference method, if direct not possible.
    - **X509 Identifier** (receive only)
    - **Subject Key Identifier** (receive only)
    - **Embedded Token References** - (receive only)
- Symmetric Data Encryption Algorithms:
  - <http://www.w3.org/2001/04/xmlenc#tripledes-cbc> (send & receive)
  - <http://www.w3.org/2001/04/xmlenc#aes128-cbc> (receive only)

- <http://www.w3.org/2001/04/xmlenc#aes256-cbc>  
(receive only)
- Encryption Key Transport Algorithms:
  - [http://www.w3.org/2001/04/xmlenc#rsa-1\\_5](http://www.w3.org/2001/04/xmlenc#rsa-1_5)  
(send & receive)
  - <http://www.w3.org/2001/04/xmlenc#rsa-oaep-mgf1p>  
(receive only)
- Signature Digest Algorithm:
  - <http://www.w3.org/2000/09/xmldsig#sha1>  
(send & receive)
- Signature Algorithm:
  - <http://www.w3.org/2000/09/xmldsig#rsa-sha1>  
(send & receive)
- Canonical XML Transform Algorithm:
  - <http://www.w3.org/2001/10/xml-exc-c14n#>  
(send & receive)

## Policy-Based Process Governance

ActiveVOS provides important process governance features. This enables continuous deployment/evolution of business processes and incremental development:

- Supports continuous operation
  - Support dynamic deployment of BPEL and SOA artifacts
  - Support version management at multiple granular levels  
-policy can be specified at process level
- Supports exception management
  - Process may be suspended on uncaught fault for examination and recovery
- Process persistence policy can be specified at multiple granular level
- Supports policy assertions for partner interaction
  - Supports WS-Policy assertions at multiple granular levels
  - Support Web Service invocation retry policy (policy can be programmatically asserted)
  - Support setting JMS messaging properties through WS-Policy assertions
- Policy-based configuration:
  - Supports a rich set of enterprise configuration options through WS-Policy assertions.
  - Support for WS-Security – Authentication, Encryption & Signature; SAML 1.1; WS-Reliable Exchange – guaranteed message delivery; and retry quality of service policy

- Runtime configuration through policy is declared and not coded

## WS-Policy & WS-Policy Attachment V1.2 (March 2006)

ActiveVOS uses the WS-Policy and WS-Policy Attachment v1.2 framework and binding to WSDL 1.1.

### WS-Security Policy Assertions

ActiveVOS provides support for built-in and user-defined policy assertions. ActiveVOS uses WS-Policy attached to endpoints and services to specify additional quality of service (QoS) attributes that apply when sending or receiving messages, including any WS-Security related items. These can be applied to:

- **myRole** – where assertions control server side behavior when receiving web service requests and sending responses.
- **partnerRole** – where assertions control the client side when sending requests to partners and receiving response messages.

The supported policy assertions are described in the [following table](#):

Policy	Description
<b>WS-Security Policy Assertions:</b>	Credentials required for access to a service
<a href="#">Authentication</a>	
<a href="#">Encryption</a>	Describes the parts of a SOAP message to encrypt
<a href="#">Signature</a>	Describes the parts of a SOAP message to sign with an XML Signature, using an X.509 Certificate token
<a href="#">Timestamp</a>	Adds a <Timestamp> element to the SOAP header of a message
<b>Other Policy Assertions:</b>	Describes when and how many times to retry an invoked service that does not reply
<a href="#">Retry</a>	
<a href="#">User-Defined Policy Assertion</a>	Placeholder for a custom solution you provide for handling messages from a particular service provider. Place where you can add <b>WS-Policy Reference</b> .
<a href="#">Engine-Managed Correlation</a>	A My Role policy assertion that directs the ActiveVOS server to use WS-Addressing to transmit replyTo endpoint references during transmissions to the Partner Role partner link
<a href="#">WS-Reliable</a>	Specifies that a partner link participates in an

<a href="#">Messaging</a>	industry-standard protocol that supports guaranteed delivery of messages
<a href="#">JMS Delivery Options</a>	For details, see <a href="#">Using a Java Messaging Service Invoke Handler</a>
<a href="#">HTTP Transport</a>	Used for REST-based invocations
<a href="#">REST Enabled</a>	Used for REST-based invocations
<a href="#">SAML</a>	The Security Assertions Markup Language (SAML) is an OASIS standard that enables loosely coupled and federated identity integration.
<a href="#">Message Validation</a>	Provide fine-grained validation of WSDL messages for a partner link to enable faster processing
<a href="#">Web Service Timeout</a>	Set an amount of time to wait for a specific Web service to time out
<a href="#">Invoke Recovery</a>	Select whether to suspend a process with a pending invoke when the recovers from a failed server
<a href="#">Send WS-Addressing Headers</a>	Explicitly add addressing to invokes
<a href="#">WSDL Binding Reference</a>	Applicable for a my role partnerlink to refer to a WSDL binding instead of RPC or Document
<a href="#">Suppress xsi:type</a>	A workaround for suppressing schema validation in SOAP messages, useful for dealing with legacy services that cannot handle xsi:type attributes

## Discovery

Discovery of services and maintain a relationship with the services being consumed is necessary for ensuring that when change occurs that one has visibility of the impact. Analysis of the impact is a feature of the ActiveVOS Designer. The mechanisms it uses to discover the services it consumes are using:

- UDDI v2 or v3
- WSIL

Imported WSDL definitions and XML schemas can be used in the project. The ActiveVOS Designer can use external references it has built to compare changes and update the imported copy after the developer has assessed the impact of a change.

## Management / Monitoring

Management and monitoring of ActiveVOS is exposed using WS-Distributed Management (WSDM 1.1). WSDM v1.1 support includes:

- WSRF Base v1.2:  
wsrf-r=<http://docs.oasis-open.org/wsrf/r-2>
- Resource Properties v1.2:  
wsrf-rp=<http://docs.oasis-open.org/wsrf/rp-2>
- Resource Lifecycle v1.2:  
wsrf-rl=<http://docs.oasis-open.org/wsrf/rl-2>
- Service Groups v1.2:  
wsrf-sg=<http://docs.oasis-open.org/wsrf/sg-2>
- Metadata (09/2004):  
wsx=<http://schemas.xmlsoap.org/ws/2004/09/mex>
- Notification v1.3:  
wsn=<http://docs.oasis-open.org/wsn/b-2>
- Topic Spaces v1.3:  
wst=<http://docs.oasis-open.org/wsn/t-1>
- MUWS Part 1 v1.1:  
muws1=<http://docs.oasis-open.org/wsdm/muws1-2.xsd>
- MUWS Part 2 v1.1:  
muws2=<http://docs.oasis-open.org/wsdm/muws2-2.xsd>

## About Active Endpoints

Active Endpoints' ([www.activevos.com](http://www.activevos.com)) ActiveVOS is the business process management system (BPMS) that development teams will love. ActiveVOS empowers project teams to create business process management (BPM) applications using services, making their businesses more agile and effective. ActiveVOS promotes mass adoption of SOA-enabled BPM applications by focusing on accelerating project delivery time with a complete, affordable and easy-to-use system. Active Endpoints is headquartered in Waltham, MA with development facilities in Shelton, CT. To find out how Active Endpoints can help your business, visit <http://www.activevos.com>, call +1 781 547 2900, or email us at [sales@activevos.com](mailto:sales@activevos.com).