The Workflow Management Coalition Specification

Workflow Management Coalition Audit Data Specification

Document Number WFMC-TC-????

15 July 1998
Draft Version 1.1a

This Specification has been authored by Workflow Management Coalition members.

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First printing, 1998

0. Change History

Version 1.0

- Initial version.

Version 1.1

- Synchronized with Interface 2 version 2.0
- Synchronized with Interface 4 version 1.0
- Synchronized with OMG Workflow Specification 1.0
- Cleanup of document format

1. Purpose

The purpose of this document is to specify what information needs to be captured and recorded from the various events occurring during a workflow enactment. This document does not define how the data is stored, but what information is to be gathered and made available for analysis. The information will be called Common Workflow Audit Data (CWAD).

This is an abstract specification from which it is intended that concrete bindings will be derived, such as SQL, C, or C++. By defining the semantics for this data, a cohesive analysis is possible when working with heterogeneous workflow products.

2. Audience

The intended audience of this document is the Workflow Management Coalition members as well as others who are interested in Common Workflow Audit Data.

3. Overview

The support of these specifications in workflow products allow analysis of consistent audit data across heterogeneous workflow products. During the initialization and execution of a process instance, multiple events occur which are of interest to a business, including WAPI events, internal WFM Engine operations and other system and application functions. With CWAD information, a business can determine what has occurred in the business operations managed by workflow.

We expect the audit information to be utilized for both analysis and derived status information. In addition the audit data could be needed for proof of execution. The workflow analysis tools will want the information presented in a consistent format, representing all events that occurred within a given set of criteria...such as, how long did process “x” take, what activities have been performed within a given process instance? The presentation of the audit data will be binding specific.

When it is necessary to know what the current status is of a given process instance, an inquiry can be made using the process instance ID. The current state (e.g. open.running) is returned. To understand where the process really is, the audit information measured against the process definition can provide an indication of the true state.

3.1 Design Assumptions

Incremental Set of Data Elements. It is assumed that as the WFM technology evolves, likewise the specifications defined in this document will evolve and will be added to in subsequent versions of this document.

- Individual workflow products will be responsible to define what information and data is recorded. However, all elements specified as required or mandatory for audit data must be implemented as defined.
- Audit data is expected to be used in conjunction with meta data, such as Process ID data or role data. Meaningful data would be available as you connect the various data elements, such as role and organizational data. Optional logging of organizational data could be recorded in either the suffix extension data or in the optional or private data records.
- It is the responsibility of the workflow user to collect audit data from heterogeneous workflow product repositories when consolidation of the data is desired. These specifications will not define a repository type for audit data, nor address archive requirements. The repository types for specific bindings will be specified in other documents.
- These audit data specifications will allow for individual product extensions which may be written by homogeneous WFM products. Vendors are encouraged to register their extensions with the WFM Coalition in order to facilitate a higher level of knowledge for the analyst reviewing the information and for possible future inclusion in these specifications.
- The audit data for each process instance will have a 'product ID' and the product will place information in the process instance audit data such that the set of information concerning the instance will be unique within the collection of audit data for that product.
- The audit data for an activity instance will have a unique ID within a process instance.
- Current Timestamp must be synchronized between process engines within a business domain and will be handled by the underlying systems.
- Code page information is required for both original and optional data.
- Restrictions in certain countries prohibit the keeping of individual's productivity records. This must be kept in mind when making decisions regarding conformance.
- Audit Data Policy will be used to control the collecting of audit data. There will be functions to create and modify a policy.
- A standard set of functions are defined to access the audit data information.

3.2 Defined Terms and Abbreviations

The terms in this document are derived from the following defined in the following documents:

- WfMC Reference Model
- WfMC Glossary
- WfMC WAPI Specification
- WfMC WAPI Naming Conventions
- WfMC Interoperability Specification

3.3 CWAD Naming Conventions

Naming will adhere to the standards described in the document WFM Coalition WAPI Naming Conventions. In addition, new naming conventions for the attributes are proposed to allow for abstract specifications of attributes.

3.4 Conformance

A vendor can not claim conformance to this or any other WfMC specification unless specifically authorized to make that claim by the WfMC. WfMC grants this permission only upon the verification of the particular vendor's implementation of the published specification, according to applicable test procedures defined by WfMC.

There are two types of conformance that relate to the audit information.

For a vendor claiming conformance to a specific conformance profile for a WfMC specification, the vendor will make available the audit information as specified in the conformance statement of the particular specification.

For a vendor claiming conformance exclusively to the audit information, such as one dealing only with metrics, the vendor must conform to the entire audit specification.

3.5 Future Considerations

This specification does not include role, user and security information, which will be handled within the scope of an administration specification, which will include the minimum organizational and security base needed for WfMC standards.

The current specification is concerned with data to be recorded as the result of a WfMC interface function event. In the future, review of process metrics will determine what derived data might be a useful extension of this specification.

4. CWAD Data Information

CWAD audit data consists of three kinds of information: Basic Data, Discretionary Data, and Private Data.

The Basic Data will be recorded and available for audit purposes. Within this information, certain defined elements are specified as mandatory or optional. The mandatory elements must be provided if the event is recorded. Because workflow vendor products operate differently, some audit information will not be applicable and will be considered Discretionary Data.

Except for the required information, contents of the Private Data information is not defined and is available for vendor and/or workflow user private use, which can include data in multiple formats, such as rich text, etc..

When audit information is requested, specific information for that particular event must be available. Depending on the type of audit information being recorded, different data elements will be required and their respective values. The initial process instance ID of the initial (root) process is the key by which all information of that instance is related.

The naming of the events recorded consist of verb-noun-verb-noun syntax. For example, when a request is sent start a process instance on a remote workflow engine, the event is "WMSentRequestStartProcessInstance." For those functions that have events recorded, the events are listed. Included are reference numbers, corresponding to the interfaces where the function is described, such as (2) = WAPI interface, (4) = Interoperability interface. Future events that have been identified, but are not part of the current specifications, are included in this specification and have no reference number ( ).

4.1 CWAD Data Types

This subsection contains definitions of the Workflow Management types that are operating system or platform dependent (see WfMC Interface 2 version 2.0).

```
typedef char              WMTInt8;
typedef short             WMTInt16;
typedef long              WMTInt32;
typedef unsigned char     WMTUInt8;
typedef unsigned short    WMTUInt16;
typedef unsigned long     WMTUInt32;
typedef WMTInt8           WMTText;
typedef WMTInt8           WMTBoolean;

#define WMFalse           0
#define WMTrue            (!WMFalse)
```

Strings are defined as text arrays; the following defines the string sizes used:

```
#define     NAME_STRING_SIZE 64
#define     UNIQUE_ID_SIZE   64
#define     TIME_STAMP_SIZE  25
```


4.2 Examples of Data Types

The following defines the generic types used to describe the CWAD records.

```
typedef {
    WMTInt16  information_length;
    } WMAInformationLength;  /* Information is either prefix or suffix info */

typedef {
    WMTText  information_type;
    }  WMAInformationType;

typedef {
    WMTText  object_id[UNIQUE_ID_SIZE];
    }  WMAObjectID; /* Object is Process, Activity or Workitem */

typedef {
    WMTText  object_state;
    }  WMAObjectState;

typedef {
    WMTText  object_name[NAME_STRING_SIZE];
    }  WMAObjectName;

typedef {
    WMTText  resource_id[UNIQUE_ID_SIZE];
    }  WMAResourceID;  /* Resource is Person, Role or Network Resource */

typedef {
    WMTText  resource_name[NAME_STRING_SIZE];
    }  WMAResourceName;

typedef {
    WMTText        attribute_name[NAME_STRING_SIZE];
    }  WMAAttributeName;

typedef {
    WMTInt32  attribute_type;
    }  WMAAttributeType;

typedef {
    WMTInt32  attribute_length;
    }  WMAAttributeLength;

typedef {
    WMTText  attribute_value[NAME_STRING_SIZE];
    }  WMAAttributeValue;

typedef {
```



```
    WMTText  session_id[UNIQUE_ID_SIZE];
    }  WMASessionID;

typedef {
    WMTInt16  code_page;
    }  WMACodePage;

typedef {
    WMTText  timestamp[TIME_STAMP_SIZE];
    }  WMATimeStamp;  /* Time zone (GMT + or - n), date, time, second, microsecond
    (microsecond is optional) */

typedef {
    WMTText  event_code;
    }  WMAEventCode;
```


4.3 CWAD Prefix Information

Attribute Name	Mandatory/ Optional	Abstract Data Type	Description
InitialProcessInstanceID	M	WMAObjectID	Unique ID of initial (root) process instance.
CurrentProcessInstanceID	M	WMAObjectID	Unique ID of current process instance.
ActivityInstanceID	O	WMAObjectID	Unique ID of current activity instance
ProcessState	M	WMAObjectState	Current state of process instance
EventCode	M	WMAEventCode	Event code value (Appendix A)
DomainID	M	WMAResourceID	ID of Domain of corresponding user
NodeID	M	WMAResourceID	ID of Node of corresponding use
UserID	O~~M~~*	WMAResourceID	ID of user whom the business would consider the primary person involved with this event. This could be a person or entity.
RoleID	O~~M~~*	WMAResourceID	The role of the user involved in this event
Timestamp	M	WMATimestamp	Timestamp at the time the event was recorded.
InformationID	M	WMAObjectID	Type of information, such as WfMC, Private

INITIAL PROCESS INSTANCE ID: The unique identification of the initial (root) process instance. A business may wish to consolidate CWAD information from multiple locations. Each instance within the consolidated set should be uniquely identifiable.

Toward that end, the Process Instance Unique ID must be prefixed by a product ID, plus other information which would make it unique. A suggestion for the ID might contain the Source Vendor ID, Domain ID and Node ID and a unique Instance ID.

In the case where an activity initiates a subprocess, the Initial Process Instance ID would contain the original process of the activity. In a hierarchy of processes, the Initial Process Instance ID would contain the Process Instance ID of the immediately above (or calling) process.

CURRENT PROCESS INSTANCE ID: The unique identification of the current process instance. The current process instance ID may be different than that of the Initial Process Instance ID if the current process instance is a subprocess.

* For vendors stating conformance to the Audit Specification, it is optional~~mandatory~~ to record either the UserID or the RoleID, which reflects the person or entity that has accomplished the work for this activity. Vendors must allow for modification of what will be recorded, allowing customers having legal or other contractual requirements to record values other than the true user/role information.

4.4 CWAD Suffix Information

The CWAD suffix information is a set of optional values which, if required by a business or vendor product, are added to multiple event audit information. This suffix information will contain the process relevant data that was specified for the particular completed process, and recorded with process or activity instance audit data.

- The suffix is required for the Process Instance and Activity Instance Audit Data information If there are no extensions, account code will be blank and the number of extensions set to zero.
- If extensions are included, the extension type and extension length will be required for each extension content.
- An extension code page will be included for each extension content. The assumption will be that all other data is recorded in the code page recorded in the prefix information.

Data Element	M / O	Abstract Data Type	Description
AccountCode	O	WMAInformationType	Accounting Code used for item of work
ExtensionNumber	M	WMTInt16	Number of extensions in suffix information
ExtensionType	M	WMAInformationType	Type of extension
ExtensionLength	O	WMAInformationLength	Total length of extension values
ExtensionCodePage	O	WMACodePage	Code Page used to record extension data content.
ExtensionContent	O	*	Content, defined by Extension Type and Length

There may be multiple extensions for each event, generating multiple table entries for that event. The extension type, length, code page, and extension content attributes will need to be recorded for each event.

Notes: Examples of ExtensionTypes can be Data, Vendor Private, Business Private, and Text.

5. Process Instance Audit Information

5.1 Create/Start Process/Subprocess Instance Audit Data

Data Elements	M/O	Data Type	Description
Prefix	M	----	CWAD Prefix Information
ProcessDefinitionID	M	WMAObjectID	Process Definition ID identifying the definition used for creating this process instance.
ProcessDefinitionBusinessName	O	WMAObjectName	Business name of the process definition relevant to the business.
Suffix	M	----	CWAD Suffix Information

Events Recorded:

Event Description	**When Created**
WMCreatedProcessInstance	(2,4) Process instance is created.
WMStartedProcessInstance	(2,4) Process instance is started.

5.2 Change Process Instance State Audit Data

Data Elements	M/O	Data Type	Description
Prefix	M	----	CWAD Prefix Information
PreviousProcessState	M~~O~~	WMAObjectState	Mandatory for Change Process State
NewProcessState	M	WMAObjectState	Mandatory for Change Process State
Suffix	M	----	CWAD Suffix Information

Events Recorded:

Event Description	**When Created**
WMChangedProcessInstanceState	(2,4) Process state has changed by API or Internal event.
WMCompletedProcessInstance	(2,4) Process instance has completed, implied by activity completion~~.~~
WMTerminatedProcessInstance	(2,4) Process instance has been terminated.
WMAbortedProcessInstance	(2,4) Process instance has been aborted.
~~WMWaitingOnEvent~~	~~( ) Process is waiting on event to occur.~~
~~WMEventOccurred~~	~~( ) Event on which a process was waiting has occurred.~~
~~WMStartedSubprocess~~	~~( )~~ Not in IF2
~~WMCompletedSubprocess~~	~~( )~~ Not in IF2

5.3 Assign Process Instance Attribute Audit Data

Data Elements	M/O	Data Type	Description
Prefix	M	----	CWAD Prefix Information
~~Changed~~AttributeName	M	WMAAttributeName	Name of attribute changed
~~Changed~~AttributeType	M	WMAAttributeType	Type of attribute changed
New~~Changed~~AttributeLength	M	WMAAttributeLength	Length of new value~~attribute changed~~
New~~Changed~~AttributeValue	M	WMAAttributeValue	New v~~V~~alue
PreviousAttributeLength	M	WMAAttributeLength	Length of old value
PreviousAttributeValue	M	WMAAttributeValue	Old value
Suffix	M	----	CWAD Suffix Information

Events Recorded:

Event Description	**When Created**
WMAssignedProcessInstanceAttributes	(2,4) Process Instance Attributes have been changed.

6. Activity Instance Audit Information

6.1 Change Activity Instance State Audit Data

When certain events occur that change the activity instance state, this information will be recorded as Activity Instance Audit Data..

Data Elements	M/ O	Data Type	Description
Prefix	M	----	CWAD Prefix Information
ActivityInstanceID	M	WMAObjectID	Unique ID for the current Activity Instance.
ActivityDefinitionBusinessName	O	WMAObjectName	Business name of the Activity
ApplicationID	O	WMAObjectID	ID of application associated with this activity
NewActivityState	M	WMAObjectState	New Activity State
PreviousActivityState	MO	WMAObjectState	Previous Activity State
Suffix	M	----	CWAD Suffix Information

Events Recorded

Event Description	**When Created**
WMChangedActivityInstanceState	(2) Activity state has changed by API or internal event. This is also used to record the initial state of the activity instance.
WMCompletedActivityInstance	(2) Activity instance has completed, implied by WorkItem completion. OMG has explicit action.
WMTerminatedActivityInstance	(2) Activity instance has been terminated, implied by terminated process instance. OMG has explicit action.
WMAbortedActivityInstance	(2) Activity instance has been aborted, implied by aborted process instance. OMG has explicit action.
~~WMWaitingOnEvent~~	~~( ) Activity is waiting on event(s) to occur.~~
~~WMEventOccurred~~	~~( ) Event(s) on which an activity was waiting has occurred.~~

6.2 Assign Activity Instance Attributes Audit Data

When the attributes to an activity instance are assigned or changed, this information is recorded.

Data Elements	M/O	Data Type	Description
Prefix	M	----	CWAD Prefix Information
ActivityInstanceID	M	WMAObjectID	Unique ID for Activity Instance
ActivityState	O	WMAObjectState	Current Activity State
~~Changed~~AttributeName	M	WMAAttributeName	Name of attribute changed
~~Changed~~AttributeType	M	WMAAttributeType	Type of attribute changed
New~~Changed~~AttributeLength	M	WMAAttributeLength	Length of new value
New~~Changed~~AttributeValue	M	WMAAttributeValue	New Value
PreviousAttributeLength	M	WMAAttributeLength	Length of previous value
PreviousAttributeValue	M	WMAAttributeValue	Previous Value
Suffix	M	----	CWAD Suffix Information

Events Recorded:

Event Description	**When Created**
WMAssignedActivityInstanceAttributes	(2) Activity Instance Attributes have been changed.

7. WorkItem Audit Information

7.1 Change WorkItem State Audit Data

A work item has a state and when a change of state occurs, the event is written.

Data Elements	M/O	Data Type	Description
Prefix	M	-----	CWAD Prefix Information
ActivityInstanceID	M	WMAObjectID	Unique ID for the current Activity Instance.
WorkItemID	M	WMAObjectID	Unique ID for the work item.
WorkItemState	M~~O~~	WMAObjectState	State of the work item
Suffix	M	----	CWAD Suffix Information

Events Recorded

Event Description	**When Created**
WMGetWorkItem	(2) Recording an Audit Data record is optional
WMChangedWorkItemState	(2) Work item state has been changed by API or internal event. This is also used to record the initial state of the WorkItem.
WMStartedWorkItem	( ) Work item has been started. Implied by Activity actions
WMCompletedWorkItem	(2) Work item has been completed.
~~WMRejectedWorkItem~~	~~( ) Work item has been rejected.~~
WMSelectedWorkItem	(2) User has selected work item off worklist. This includes get, select, reserve, checkout.

7.2 Assign/Reassign WorkItem Audit Data

When a work item is assigned or reassigned, the audit information is written.

Data Elements	M/ O	Data Type	Description
Prefix	M	----	CWAD Prefix Information
ActivityInstanceID	M	WMAObjectID	Unique ID for current Activity Instance.
WorkItemID	M	WMAObjectID	Unique ID for work item.
WorkItemState	M	WMAObjectState	State of work item
TargetDomainID	M	WMAResourceID	Domain ID for user being assigned work item
TargetNodeID	M	WMAResourceID	Node ID for user being assigned work item.
TargetUserID	O	WMAResourceID	User ID for user being assigned work item.
TargetRoleID	O	WMAResourceID	Role ID for user being assigned work item.
Suffix	M	----	CWAD Suffix Information

Events Recorded

Event Description	**When Created**
WMAssignedWorkItem	(2) Work item is placed on user's worklist. Implied by Activity actions.
WMReassignedWorkItem	(2) Work item has been reassigned to one or more users.
~~WMReassignedWorklist~~	~~(2) Entire worklist of a user has been reassigned to one or more users.~~

Notes:

For a worklist to be reassigned, the assignment is by multiple work item assignments.

7.3 Assign Work Item Attribute Audit Data

Data Elements	M/O	Data Type	Description
Prefix	M	----	CWAD Prefix Information
ActivityInstanceID	M	WMAObjectID	Unique ID for Activity Instance
ActivityState	O	WMAObjectState	Current Activity State
AttributeName	M	WMAAttributeName	Name of attribute changed
AttributeType	M	WMAAttributeType	Type of attribute changed
NewAttributeLength	M	WMAAttributeLength	Length of new value
NewAttributeValue	M	WMAAttributeValue	New Value
PreviousAttributeLength	M	WMAAttributeLength	Length of previous value
PreviousAttributeValue	M	WMAAttributeValue	Previous Value
Suffix	M	----	CWAD Suffix Information

Events Recorded

Event Description	When Created
WMAssignedWorkItemAttributes	(2) When a workitem attribute is assigned a value

8. Remote Operations Information

8.1 Remote Process Operations Audit Data

The Remote Process Operations Data is written as the result of receiving information about a remote process which is linked to a process operating on the local WFM Engine. The local WFM Engine writes the record.

Data Elements	M/O	Data Type	Description
Prefix	M	----	CWAD Prefix Information
MessageID	O	WMAObjectID	Message ID associated with event.
SourceActivityInstanceID	M	WMAObjectID	Original Activity Instance ID that is associated with this work item, which originated on the Source WFE.
RemoteNodeID	M	WMAResourceID	Node ID of remote WFE
RemoteProcessInstanceID	M	WMAObjectID	Remote WFE Process Instance ID
RemoteActivityInstanceID	M	WMAObjectID	Remote WFE Activity Instance ID
RemoteTimestamp	M	WMATimestamp	Timestamp of data sent by remote WFE
RemoteProcessDefinition BusinessName	O	WMAObjectName	Business name of the relevant process definition of Remote WFE
RemoteActivityDefinition BusinessName	O	WMAObjectName	Business Name for current activity from remote process/subprocess.
AttributeName	O	WMAAttributeName	Name of Attribute
AttributeType	O	WMAAttributeType	Type of Attribute
AttributeLength	O	WMAAttributeLength	Length of Attribute
AttributeValue	O	WMAAttributeValue	Value of Attribute
Suffix	M	----	CWAD Suffix Information

Events Recorded

Event Description	**When Created**
WMStartedProcessInstance	(4) Process Instance has been started
WMCreatedProcessInstance	(4) Process Instance has been created
WMAbortedProcessInstance	(4) Process Instance has been aborted
WMTerminatedProcessInstance	(4) Process Instance has been terminated
WMChangedProcessInstanceState	(4) Process Instance State has been changed
WMAssignedProcessInstanceAttribute	(4) Process Instance Attributes values have been assigned/changed.
WMCompletedProcessInstance	(4) Process Instance has completed.

Notes: The ProcessInstanceID and the ActivityInstanceID of the original WFE must be recorded and passed to the remote WFE, in order to synchronize process/activity when the remote WFE has completed their processes.

~~1.2~~8.2 Link-to-Remote Subprocess Audit Data

The Link-to-Remote Subprocess audit data is written when a WFM Engine starts a process on an Engine at a remote location. It is written by the local Engine.

Data Elements	M/O	Data Type	Description
Prefix	M	----	CWAD Prefix Information
MessageID	O	WMAObjectID	Message ID associated with event.
SourceActivityDefinition BusinessName	O	WMAObjectName	Business name of current activity on the source engine initiating the link.
TargetProcessDefinitionID	O	WMAObjectID	Process Definition ID of the process to be started on remote system
TargetProcessInstanceID	M	WMAObjectID	Process instance on remote target WFE
TargetProcessDefinition BusinessName	O	WMAObjectName	Process to be started at remote WFE, probably a symbolic name known by remote WFE.
TargetNodeID	M	WMAResourceID	Node ID of remote target WFE
TargetUserID	O	WMAResourceID	ID of remote user requested to perform the process.
TargetRoleID	O	WMAResourceID	ID of remote role requested to perform the process.
TargetState	O	WMAObjectState	Requested new state for the target activity.
AttributeName	O	WMAAttributeName	Name of Attribute
AttributeType	O	WMAAttributeType	Type of Attribute
AttributeLength	O	WMAAttributeLength	Length of Attribute
AttributeValue	O	WMAAttributeValue	Value of Attribute
Suffix	M	----	CWAD Suffix Information

Events Recorded:

Event Description	**When Created**
WMSentRequestCreateProcessInstance	(4) Request sent to create a process instance on A remote WFM Engine
WMSentRequestStartProcessInstance is overloaded	
WMSentRequestStartProcessInstance	(4) Request sent to start a process instance on a remote WFM Engine
WMSentRequestAbortProcessInstance	(4) Request sent to abort a process instance on remote WFM Engine.
WMSentRequestTerminateProcessInstance	(4) Request sent to terminate a process instance on remote WFM Engine.

WMSentRequestChangeProcessInstanceAttribute	(4) Request sent to change process instance on remote WFM Engine.
WMSentRequestGetProcessInstanceAttribute	(4) Request sent to get process instance attribute on remote WFM Engine.
WMSentRequestChangeProcessInstanceState	(4) Request sent to change process instance state on remote WFM engine.

Response Events	**When Created**
WMSentCreatedProcessInstance	(4) Response sent to remote WFM Engine when process instance has been created.
WMSentStartedProcessInstance is overloaded	
WMSentStartedProcessInstance	(4) Response sent to remote WFM Engine when process instance has started.
WMSentChangedProcessInstanceAttribute	(4) Response sent to remote WFM Engine when process instance attribute has been changed.
WMSentRetrievedProcessInstanceAttribute	(4) Response sent to remote WFM Engine when process instance attribute has been retrieved.
WMSentAbortedProcessInstance	(4) Response sent to remote WFM Engine when process instance has been aborted.
WMSentTerminatedProcessInstance	(4) Response sent to remote WFM Engine when process instance has been terminated.
WMSentChangedProcessInstanceState	(4) Response sent to remote WFM Engine when process instance state has changed.
WMSentCompletedProcessInstance	(4) Response sent to remote WFM Engine when process instance has completed.

8.3 Link-From-Remote Subprocess Audit Data

The Link-From-Remote Subprocess audit data is written when a 'start process' is received from a remote WFM Engine, and written by the receiving WFE. The information is used to link the requested subprocess to be started with the remote WFE process/subprocess.

Data Elements	M/O	Data Type	Description
Prefix	M	----	CWAD Prefix Information
MessageID	O	WMAObjectID	Message ID associated with event.
SourceInitialProcessInstanceID	M	WMAObjectID	Initial Process Instance ID of source WFE
SourceCurrentProcessInstanceID	M	WMAObjectID	Current Process Instance Id of source WFE
SourceActivityInstanceID	M	WMAObjectID	Activity Instance ID of the source WFE
SourceTimestamp	M	WMATimestamp	Timestamp of source WFE event
SourceNodeID	M	WMAResourceID	Node ID of remote WFE
SourceUserID	M	WMAResourceID	User ID associated with the remote WFE request
SourceRoleID	M	WMAResourceID	Role ID corresponding with User ID
SourceProcessDefinitionID	O	WMAObjectID	Process Definition ID requested by Source engine
SourceProcessDefinition BusinessName	O	WMAObjectName	Business name of remote WFE process that generated the request.
SourceActivityDefinition BusinessName	O	WMAObjectName	Business name of the remote WFE activity spawning the request
SourceRequestedState	O	WMAObjectState	Request for state received from remote WFE.
AttributeName	O	WMAAttributeName	Name of Attribute
AttributeType	O	WMAAttributeType	Type of Attribute
AttributeLength	O	WMAAttributeLength	Length of Attribute
AttributeValue	O	WMAAttributeValue	Value of Attribute
Suffix	M	----	CWAD Suffix Information

Events Recorded:

Event Description	**When Created**
WMReceivedRequestCreateProcessInstance	(4) Received request from remote WFM Engine to create process instance.

WMReceivedRequestStartProcessInstance is overloaded

WMReceivedRequestStartProcessInstance	(4) Received request from remote WFM Engine to start process instance.
WMReceivedRequestAbortProcessInstance	(4) Request received from remote WFM Engine to abort process instance.
WMReceivedRequestTerminateProcessInstance	(4) Request received from remote WFM Engine to terminate process instance.
WMReceivedRequestChangeProcessInstanceState	(4) Request received from remote WFM engine to change process instance state.
WMReceivedRequestChangeProcessInstanceAttribute	(4) Request received from remote WFM Engine to change process instance attribute.
WMReceivedRequestGetProcessInstanceAttribute	(4) Request received from remote WFM to get process instance attribute.

Response Events Description	**When Created**
DWMReceivedCreatedProcessInstance	(4) Response received from remote WFM Engine when process instance has been created.

WMReceivedStartedProcessInstance is overloaded

WMReceivedStartedProcessInstance	(4) Response received from remote WFM Engine when process instance has started.
WMReceivedChangedProcessInstanceAttribute	(4) Response received from remote WFM Engine when process instance attribute has been changed.
WMReceivedRetrievedProcessInstanceAttribute	(4) Response received from remote WFM Engine when process instance attribute has been retrieved.
WMReceivedAbortedProcessInstance	(4) Response received from remote WFM Engine when process instance has been aborted.
WMReceivedTerminatedProcessInstance	(4) Response received from remote WFM Engine when process instance has been terminated.
WMReceivedChangedProcessInstanceState	(4) Response received from remote WFM Engine when process instance state has changed.
WMReceivedCompletedProcessInstance	(4) Response received from remote WFM Engine when process instance has completed.

8.4 Session Management Audit Data

The Session Management information is written when a session is established between two WFM Engines. Both WFM Engines need to record this information at the time of session connection.

Data Elements	M/O	Data Type	Description
Prefix	M	----	CWAD Prefix Information
MessageID	O	WMAObjectID	Message ID associated with event.
CorrespondentDomainID	M	WMAResourceID	DomainID of accepting the session request.
CorrespondentNodeID	M	WMAResourceID	Node ID of accepting the session request.
Suffix	M	----	CWAD Suffix Information

Events Recorded:

Event Description	**When Created**
WMStartedSession	(4M*) Start a Session with a remote WFM Engine
WMStoppedSession	(4M*) Stop a session with a remote WFM Engine.

* NOTE: 4M refers to the Interoperability interface MIME binding.

9. Process Definition Audit Information

9.1 Change Process Definition State Audit Data

When the state of the process definition is changed, the information is written to the audit data. A state change may occur as the result of a State Change API command or as the result of internal WFM Engine operations. This would correspond to the WMChangeProcessDefinitionState, which allows process definitions to be changed temporarily to a specific states, such as *disabled* or *enabled.*

Name	M/O	Data Type	Description
Prefix	M	----	CWAD Prefix Information
ProcessDefinitionID	M	WMAObjectID	Unique ID of the process definition
NewProcessDefinitionState	M	WMAObjectState	New state for the process definition
PreviousProcessDefinitionState	M	WMAObjectState	Previous state for process definition
Suffix	O	----	CWAD Suffix Information

Events Recorded:

Event Description	**When Created**
WMChangedProcessDefinitionState	(2) State of Process definition has been changed.

10. Discretionary Audit Information

Discretionary Audit Data information is information that are agreed upon by two or more vendors to be recorded, yet are not required for WfMC conformance.

We will describe the data elements for the optional data. However, the items that might be considered are return codes, error messages, work item priorities, route assigned and taken, security, code page, and expected duration.

Data Elements	M/O	Data Types	Description
Prefix Information	M	----	CWAD Prefix
Suffix Information	M	----	CWAD Suffix

Notes: Future expansion

11. Private Audit Information

Private Audit Data information is data which is specific or private to a particular vendor's workflow product. They are not defined by the Coalition, only the format will be defined. Suggested data might include error messages, program specific data pointers...any data that is necessary for derived data for user, transaction, cost, trend, critical path, and/or optimization analysis.

Data Elements	M/O	Data Types	Description
Prefix Information	M	----	CWAD Prefix
Suffix Information	M	----	CWAD Suffix

Notes: Future Expansion

12. Appendix A: Event Codes

The following are the event codes and when they are created. The naming of the events recorded consist of verb-noun-verb-noun syntax. For example, when a request is sent start a process instance on a remote workflow engine, the event is "WMSentRequestStartProcessInstance." For those functions that have events recorded, the events are listed. Included are reference numbers, corresponding to the interfaces where the function is described, such as (2) = WAPI interface, (4) = Interoperability interface. Future events that have been identified, but are not part of the current specifications, are included in this specification and have no reference number ( ).

12.1 Process Instance Audit Information

Create/Start Process/Subprocess Instance Audit Data

WMCreatedProcessInstance	(2,4) Process instance is created.
WMStartedProcessInstance	(2,4) Process instance is started.

Change Process/Subprocess Instance State Audit Data

WMChangedProcessInstanceState	(2,4) Process state has changed by API or internal event.
WMCompletedProcessInstance	(2,4) Process instance has completed.
WMTerminatedProcessInstance	(2,4) Process instance has been terminated.
WMAbortedProcessInstance	(2,4) Process instance has been aborted.
WMWaitingOnEvent	( ) Process is waiting on event(s) to occur.
WMEventOccurred	( ) Event(s) on which a process was waiting has occurred.
WMStartedSubprocess	( )
WMCompletedSubprocess	( )

Assign Process Instance Attributes Audit Data

WMAssignedProcessInstanceAttributes	(2,4) Process Instance Attributes have been changed.

12.2 Activity Instance Audit Information

Change Activity Instance State Audit Data

WMChangedActivityInstanceState	(2) Activity state has changed by API or internal event. This is also used to record the initial state of the activity instance.
WMCompletedActivityInstance	(2) Activity instance has completed.
WMTerminatedActivityInstance	(2) Activity instance has been terminated.
WMAbortedActivityInstance	(2) Activity instance has been aborted.
WMWaitingOnEvent	( ) Activity is waiting on event(s) to occur.
WMEventOccurred	( ) Event(s) on which an activity was waiting has occurred.

Assign Activity Instance Attributes Audit Data

WMAssignActivityInstanceAttributes	(2) Activity Instance Attributes have been changed.

12.3 Workitem Audit Information

Change Workitem State Audit Data

WMStartedWorkItem	(2) Work item has been started.
WMCompletedWorkItem	( ) Work item has been completed.
WMRejectedWorkItem	(2) Work item has been rejected.
WMSelectedWorkItem	(2) User has selected work item off worklist. This includes get, select, reserve, checkout.
WMChangedWorkItemState	(2) Work item state has been changed by API or internal event. This is also used to record the initial state of the work item.

Assign/Reassign Workitem/Worklist Audit Data

WMAssignedWorkItem	(2) Work item is placed on user's worklist
WMReassignedWorkItem	(2) Work item has been reassigned to one or more users.
WMReassignedWorklist	(2) Entire worklist of a user has been reassigned to one or more users.

12.4 Remote Operation Audit Information

Remote Process Operation Audit Data

WMStartedProcessInstance	(4) Process Instance has been started
WMCreatedProcessInstance	(4) Process Instance has been created
WMAbortedProcessInstance	(4) Process Instance has been aborted
WMTerminatedProcessInstance	(4) Process Instance has been terminated
WMChangedProcessInstanceState	(4) Process Instance State has been changed
WMAssignedProcessInstanceAttribute	(4) Process Instance Attributes values have been assigned/changed.
WMCompletedProcessInstance	(4) Process Instance has completed.

Link to Remote Subprocess Audit Data

WMSentRequestStartProcessInstance	(4) Request sent to start a process instance on a remote WFM Engine
WMSentRequestAbortProcessInstance	(4) Request sent to abort a process instance on remote WFM Engine.
WMSentRequestTerminateProcessInstance	(4) Request sent to terminate a process instance on remote WFM Engine.
WMSentRequestChangeProcessInstanceAttribute	(4) Request sent to change process instance on remote WFM Engine.
WMSentRequestGetProcessInstanceAttribute	(4) Request sent to get process instance attribute on remote WFM Engine.
WMSentRequestChangeProcessInstanceState	(4) Request sent to change process instance state on remote WFM engine.

Responses

WMSentStartedProcessInstance	(4) Response sent to remote WFM Engine when process instance has started.
WMSentChangedProcessInstanceAttribute	(4) Response sent to remote WFM Engine when process instance attribute has been changed.
WMSentRetrievedProcessInstanceAttribute	(4) Response sent to remote WFM Engine when process instance attribute has been retrieved.
WMSentAbortedProcessInstance	(4) Response sent to remote WFM Engine when process instance has been aborted.
WMSentTerminatedProcessInstance	(4) Response sent to remote WFM Engine when process instance has been terminated.
WMSentChangedProcessInstanceState	(4) Response sent to remote WFM Engine when process instance state has changed.
WMSentCompletedProcessInstance	(4) Response sent to remote WFM Engine when process instance has completed.

Link From Remote Subprocess Audit Data

WMReceivedRequestStartProcessInstance	(4) Received request from remote WFM Engine to start process instance.
WMReceivedRequestAbortProcessInstance	(4) Request received from remote WFM Engine to abort process instance.
WMReceivedRequestTerminateProcessInstance	(4) Request received from remote WFM Engine to terminate process instance.
WMReceivedRequestChangeProcessInstanceState	(4) Request received from remote WFM Engine to change process instance state.
WMReceivedRequestChangeProcessInstanceAttribute	(4) Request received from remote WFM Engine to change process instance attribute.
WMReceivedRequestGetProcessInstanceAttribute	(4) Request received from remote WFM to get process instance attribute.

Responses

WMReceivedStartedProcessInstance	(4) Response received from remote WFM Engine when process instance has started.
WMReceivedChangedProcessInstanceAttribute	(4) Response received from remote WFM Engine when process instance attribute has been changed.
WMReceivedRetrievedProcessInstanceAttribute	(4) Response received from remote WFM Engine when process instance attribute has been retrieved.
WMReceivedAbortedProcessInstance	(4) Response received from remote WFM Engine when process instance has been aborted.
WMReceivedTerminatedProcessInstance	(4) Response received from remote WFM Engine when process instance has been terminated.
WMReceivedChangedProcessInstanceState	(4) Response received from remote WFM Engine when process instance state has changed.
WMReceivedCompletedProcessInstance	(4) Response received from remote WFM Engine when process instance has completed.

Session Management Audit Data

WMStartedSession	(4M*) Start a Session with a remote WFM Engine
WMStoppedSession	(4M*) Stop a session with a remote WFM Engine.

* NOTE: 4M refers to the Interoperability interface MIME binding.

12.5 Process Definition Audit Information

Process Definition State Change Audit Data

WMChangedProcessDefinitionState	(2) State of Process definition has been changed.

