

ANNEX A (normative)

IDL application programmer's interface

```
//File: RTI.idl
//This module is the interface to the Runtime Infrastructure (RTI)
//of the High Level Architecture (HLA)

#if !defined(_RTI_IDL_)
#define _RTI_IDL_

#pragma prefix "omg.org"
#include <orb.idl>

module RTI {

    #define RTI_EXCEPT(A) \
    exception A { \
        unsigned long serial; \
        string reason; \
    };

    RTI_EXCEPT(AsynchronousDeliveryAlreadyDisabled)
    RTI_EXCEPT(AsynchronousDeliveryAlreadyEnabled)
    RTI_EXCEPT(AttributeAcquisitionWasNotRequested)
    RTI_EXCEPT(AttributeAcquisitionWasNotCanceled)
    RTI_EXCEPT(AttributeAlreadyBeingAcquired)
    RTI_EXCEPT(AttributeAlreadyBeingDivested)
    RTI_EXCEPT(AttributeAlreadyOwned)
    RTI_EXCEPT(AttributeDivestitureWasNotRequested)
    RTI_EXCEPT(AttributeNotDefined)
    RTI_EXCEPT(AttributeNotKnown)
    RTI_EXCEPT(AttributeNotOwned)
    RTI_EXCEPT(AttributeNotPublished)
    RTI_EXCEPT(CouldNotDiscover)
    RTI_EXCEPT(CouldNotOpenFED)
    RTI_EXCEPT(CouldNotRestore)
    RTI_EXCEPT(DeletePrivilegeNotHeld)
    RTI_EXCEPT(DimensionNotDefined)
    RTI_EXCEPT(EnableTimeConstrainedPending)
    RTI_EXCEPT(EnableTimeConstrainedWasNotPending)
    RTI_EXCEPT(EnableTimeRegulationPending)
    RTI_EXCEPT(EnableTimeRegulationWasNotPending)
    RTI_EXCEPT(ErrorReadingFED)
    RTI_EXCEPT(EventNotKnown)
    RTI_EXCEPT(FederateAlreadyExecutionMember)
    RTI_EXCEPT(FederateInternalError)
    RTI_EXCEPT(FederateLoggingServiceCalls)
    RTI_EXCEPT(FederateNotExecutionMember)
    RTI_EXCEPT(FederateOwnsAttributes)
    RTI_EXCEPT(FederateWasNotAskedToReleaseAttribute)
    RTI_EXCEPT(FederatesCurrentlyJoined)
    RTI_EXCEPT(FederationExecutionAlreadyExists)
    RTI_EXCEPT(FederationExecutionDoesNotExist)
    RTI_EXCEPT(FederationTimeAlreadyPassed)
    RTI_EXCEPT(InteractionClassNotDefined)
    RTI_EXCEPT(InteractionClassNotKnown)
    RTI_EXCEPT(InteractionClassNotPublished)
    RTI_EXCEPT(InteractionClassNotSubscribed)
    RTI_EXCEPT(InteractionParameterNotDefined)
    RTI_EXCEPT(InteractionParameterNotKnown)
    RTI_EXCEPT(InvalidExtents)
    RTI_EXCEPT(InvalidFederationTime)
```

```

RTI_EXCEPT(InvalidLookahead)
RTI_EXCEPT(InvalidOrderingHandle)
RTI_EXCEPT(InvalidRegionContext)
RTI_EXCEPT(InvalidResignAction)
RTI_EXCEPT(InvalidRetractionHandle)
RTI_EXCEPT(InvalidTransportationHandle)
RTI_EXCEPT(NameNotFound)
RTI_EXCEPT(ObjectClassNotDefined)
RTI_EXCEPT(ObjectClassNotKnown)
RTI_EXCEPT(ObjectClassNotPublished)
RTI_EXCEPT(ObjectClassNotSubscribed)
RTI_EXCEPT(ObjectNotKnown)
RTI_EXCEPT(ObjectAlreadyRegistered)
RTI_EXCEPT(RegionNotKnown)
RTI_EXCEPT(RestoreInProgress)
RTI_EXCEPT(RestoreNotRequested)
RTI_EXCEPT(RTIinternalError)
RTI_EXCEPT(SpaceNotDefined)
RTI_EXCEPT(SaveInProgress)
RTI_EXCEPT(SaveNotInitiated)
RTI_EXCEPT(SpecifiedSaveLabelDoesNotExist)
RTI_EXCEPT(SynchronizationPointLabelWasNotAnnounced)
RTI_EXCEPT(TimeAdvanceAlreadyInProgress)
RTI_EXCEPT(TimeAdvanceWasNotInProgress)
RTI_EXCEPT(TimeConstrainedAlreadyEnabled)
RTI_EXCEPT(TimeConstrainedWasNotEnabled)
RTI_EXCEPT(TimeRegulationAlreadyEnabled)
RTI_EXCEPT(TimeRegulationWasNotEnabled)
RTI_EXCEPT(UnableToPerformSave)

```

```

enum ObjectState {
    KNOWN_TO_FEDERATE,
    HOLDING_TOKENS,
    DELETED
};

```

```

enum ResignAction {
    RELEASE_ATTRIBUTES,
    DELETE_OBJECTS,
    DELETE_OBJECTS_AND_RELEASE_ATTRIBUTES,
    NO_ACTION
};

```

```

enum FederateStateType {
    RUNNING,
    SAVING,
    RESTORING
};

```

```

enum TimeManagerStateType {
    IDLE,
    TIME_ADVANCING
};

```

```

typedef unsigned short UShort;
typedef unsigned long ULong;
typedef double Double;
typedef long Long;
typedef boolean Boolean;

```

```

typedef ULong ExtentIndex;
typedef ULong Handle;
typedef Handle SpaceHandle;
typedef Handle ObjectClassHandle;
typedef Handle InteractionClassHandle;
typedef Handle AttributeHandle;
typedef Handle ParameterHandle;
typedef Handle ObjectHandle;
typedef Handle DimensionHandle;
typedef Handle FederateHandle;
typedef Handle TransportationHandle;
typedef TransportationHandle TransportType;

```

```

typedef Handle OrderingHandle;
typedef OrderingHandle OrderType;
typedef ULong FederateID;
typedef ULong UniqueID;
typedef unsigned long long FederationTime; //temporary awaiting Obv
typedef sequence<octet> UserSuppliedTag;

typedef string FederationExecutionName;
typedef string FederateName;
typedef string FileName;
typedef string SynchronizationPointLabel;
typedef string SaveLabel;
typedef string ObjectName;
typedef string ObjectClassName;
typedef string AttributeName;
typedef string InteractionClassName;
typedef string ParameterName;
typedef string SpaceName;
typedef string DimensionName;
typedef string TransportationName;
typedef string OrderingName;

typedef sequence<AttributeHandle> AttributeHandleSet;
typedef sequence<ParameterHandle> ParameterHandleSet;

typedef sequence<octet> Value;
struct HandleValuePair {
    Handle handle;
    Value value;
};
typedef sequence<HandleValuePair> HandleValuePairSet;

typedef HandleValuePairSet AttributeHandleValuePairSet;
typedef HandleValuePairSet ParameterHandleValuePairSet;

typedef sequence<FederateHandle> FederateHandleSet;

struct EventRetractionHandle {
    UniqueID        theSerialNumber;
    FederateHandle  sendingFederate;
};

struct Extent {
    DimensionHandle theDimension;
    ULong           lowerBound;
    ULong           upperBound;
};

struct Region {
    sequence<Extent> extents;
    SpaceHandle space;
};

interface FederateAmbassador;

interface RTIAmbassador {
#include "rti_amb_services.idl"
}; /* interface RTIAmbassador */

interface FederateAmbassador {
#include "fed_amb_services.idl"
}; /* interface FederateAmbassador */

}; /* module RTI */
#pragma version RTI 1.3

#endif /* _RTI_IDL_ */

```

```

//File: rti_amb_services.idl
//included in RTI.idl
//Defines the methods on the interface RTIambassador
//in module RTI

#if !defined(_RTI_AMB_SERVICES_IDL_)
#define _RTI_AMB_SERVICES_IDL_

////////////////////
// Federation Management Services //
////////////////////

// 4.2
void createFederationExecution (
    in FederationExecutionName executionName,
    in FileName FED)
raises (
    FederationExecutionAlreadyExists,
    RTIinternalError);

// 4.3
void destroyFederationExecution (
    in FederationExecutionName executionName)
raises (
    FederatesCurrentlyJoined,
    FederationExecutionDoesNotExist,
    RTIinternalError);

// 4.4
FederateHandle
joinFederationExecution (
    in FederateName yourName,
    in FederationExecutionName executionName,
    in FederateAmbassador federateAmbassadorReference)
raises (
    FederateAlreadyExecutionMember,
    FederationExecutionDoesNotExist,
    CouldNotOpenFED,
    ErrorReadingFED,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 4.5
void resignFederationExecution (
    in ResignAction theAction)
raises (
    FederateOwnsAttributes,
    FederateNotExecutionMember,
    InvalidResignAction,
    RTIinternalError);

// 4.6
void registerFederationSynchronizationPoint (
    in SynchronizationPointLabel label,
    in UserSuppliedTag theTag)
raises (
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

void registerFederationSynchronizationPointWithSet (
    in SynchronizationPointLabel label,
    in UserSuppliedTag theTag,
    in FederateHandleSet syncSet)
raises (
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 4.9
void synchronizationPointAchieved (

```

```

    in SynchronizationPointLabel label)
raises (
    SynchronizationPointLabelWasNotAnnounced,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 4.11
void requestFederationSaveWithTime (
    in SaveLabel      label,
    in FederationTime theTime)
raises (
    FederationTimeAlreadyPassed,
    InvalidFederationTime,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

void requestFederationSave (
    in SaveLabel      label)
    raises (
        FederateNotExecutionMember,
        SaveInProgress,
        RestoreInProgress,
        RTIinternalError);

// 4.13
void federateSaveBegun ()
raises (
    SaveNotInitiated,
    FederateNotExecutionMember,
    RestoreInProgress,
    RTIinternalError);

// 4.14
void federateSaveComplete ()
raises (
    SaveNotInitiated,
    FederateNotExecutionMember,
    RestoreInProgress,
    RTIinternalError);

void federateSaveNotComplete ()
raises (
    SaveNotInitiated,
    FederateNotExecutionMember,
    RestoreInProgress,
    RTIinternalError);

// 4.16
void requestFederationRestore (
    in SaveLabel      label)
raises (
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 4.20
void federateRestoreComplete ()
    raises (
        RestoreNotRequested,
        FederateNotExecutionMember,
        RTIinternalError);

void federateRestoreNotComplete ()
raises (
    RestoreNotRequested,
    FederateNotExecutionMember,
    RTIinternalError);

```

```

////////////////////////////////////////
// Declaration Management Services //
////////////////////////////////////////

// 5.2
void publishObjectClass (
    in ObjectClassHandle  theClass,
    in AttributeHandleSet attributeList)
raises (
    ObjectClassNotDefined,
    AttributeNotDefined,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 5.3
void unpublishObjectClass (
    in ObjectClassHandle theClass)
raises (
    ObjectClassNotDefined,
    FederateOwnsAttributes,
    ObjectClassNotPublished,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 5.4
void publishInteractionClass (
    in InteractionClassHandle theInteraction)
raises (
    InteractionClassNotDefined,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 5.5
void unpublishInteractionClass (
    in InteractionClassHandle theInteraction)
raises (
    InteractionClassNotDefined,
    InteractionClassNotPublished,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 5.6
void subscribeObjectClassAttributes (
    in ObjectClassHandle  theClass,
    in AttributeHandleSet attributeList,
    in Boolean             active)
raises (
    ObjectClassNotDefined,
    AttributeNotDefined,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 5.7
void unsubscribeObjectClass (
    in ObjectClassHandle theClass)
raises (
    ObjectClassNotDefined,
    ObjectClassNotSubscribed,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

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// 5.8
void subscribeInteractionClass (
    in InteractionClassHandle theClass,
    in Boolean                 active)
raises (
    InteractionClassNotDefined,
    FederateNotExecutionMember,
    FederateLoggingServiceCalls,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 5.9
void unsubscribeInteractionClass (
    in InteractionClassHandle theClass)
raises (
    InteractionClassNotDefined,
    InteractionClassNotSubscribed,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

////////////////////
// Object Management Services //
////////////////////

// 6.2
ObjectHandle
registerObjectInstanceWithName (
    in ObjectClassHandle theClass,
    in ObjectName         theObject)
raises (
    ObjectClassNotDefined,
    ObjectClassNotPublished,
    ObjectAlreadyRegistered,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

ObjectHandle
registerObjectInstance (
    in ObjectClassHandle theClass)
raises (
    ObjectClassNotDefined,
    ObjectClassNotPublished,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 6.4
EventRetractionHandle
updateAttributeValuesWithTime (
    in ObjectHandle           theObject,
    in AttributeHandleValuePairSet theAttributes,
    in FederationTime         theTime,
    in UserSuppliedTag        theTag)
raises (
    ObjectNotKnown,
    AttributeNotDefined,
    AttributeNotOwned,
    InvalidFederationTime,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

void updateAttributeValues (
    in ObjectHandle           theObject,
    in AttributeHandleValuePairSet theAttributes,
    in UserSuppliedTag        theTag)
raises (

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    ObjectNotKnown,
    AttributeNotDefined,
    AttributeNotOwned,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 6.6
EventRetractionHandle
sendInteractionWithTime (
    in InteractionClassHandle      theInteraction,
    in ParameterHandleValuePairSet theParameters,
    in FederationTime              theTime,
    in UserSuppliedTag             theTag)
raises (
    InteractionClassNotDefined,
    InteractionClassNotPublished,
    InteractionParameterNotDefined,
    InvalidFederationTime,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

void sendInteraction (
    in InteractionClassHandle      theInteraction,
    in ParameterHandleValuePairSet theParameters,
    in UserSuppliedTag             theTag)
raises (
    InteractionClassNotDefined,
    InteractionClassNotPublished,
    InteractionParameterNotDefined,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 6.8
EventRetractionHandle
deleteObjectInstanceWithTime (
    in ObjectHandle    objectHandle,
    in FederationTime  theTime,
    in UserSuppliedTag theTag)
raises (
    ObjectNotKnown,
    DeletePrivilegeNotHeld,
    InvalidFederationTime,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

void deleteObjectInstance (
    in ObjectHandle    objectHandle,
    in UserSuppliedTag theTag)
raises (
    ObjectNotKnown,
    DeletePrivilegeNotHeld,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 6.10
void localDeleteObjectInstance (
    in ObjectHandle    objectHandle)
raises (
    ObjectNotKnown,
    FederateOwnsAttributes,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

```



```

// 6.11
void changeAttributeTransportType (
    in ObjectHandle          theObject,
    in AttributeHandleSet    theAttributes,
    in TransportationHandle   theType)
raises (
    ObjectNotKnown,
    AttributeNotDefined,
    AttributeNotOwned,
    InvalidTransportationHandle,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 6.12
void changeInteractionTransportType (
    in InteractionClassHandle theClass,
    in TransportationHandle   theType)
raises (
    InteractionClassNotDefined,
    InteractionClassNotPublished,
    InvalidTransportationHandle,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 6.15
void requestObjectAttributeValueUpdate (
    in ObjectHandle          theObject,
    in AttributeHandleSet    theAttributes)
raises (
    ObjectNotKnown,
    AttributeNotDefined,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

void requestClassAttributeValueUpdate (
    in ObjectClassHandle     theClass,
    in AttributeHandleSet    theAttributes)
raises (
    ObjectClassNotDefined,
    AttributeNotDefined,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

////////////////////
// Ownership Management Services //
////////////////////

// 7.2
void unconditionalAttributeOwnershipDivestiture (
    in ObjectHandle          theObject,
    in AttributeHandleSet    theAttributes)
raises (
    ObjectNotKnown,
    AttributeNotDefined,
    AttributeNotOwned,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 7.3
void negotiatedAttributeOwnershipDivestiture (
    in ObjectHandle          theObject,
    in AttributeHandleSet    theAttributes,
    in UserSuppliedTag       theTag)

```

```

raises (
    ObjectNotKnown,
    AttributeNotDefined,
    AttributeNotOwned,
    AttributeAlreadyBeingDivested,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 7.7
void attributeOwnershipAcquisition (
    in ObjectHandle      theObject,
    in AttributeHandleSet desiredAttributes,
    in UserSuppliedTag   theTag)
raises (
    ObjectNotKnown,
    ObjectClassNotPublished,
    AttributeNotDefined,
    AttributeNotPublished,
    FederateOwnsAttributes,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 7.8
void attributeOwnershipAcquisitionIfAvailable (
    in ObjectHandle      theObject,
    in AttributeHandleSet desiredAttributes)
raises (
    ObjectNotKnown,
    ObjectClassNotPublished,
    AttributeNotDefined,
    AttributeNotPublished,
    FederateOwnsAttributes,
    AttributeAlreadyBeingAcquired,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 7.11
AttributeHandleSet
attributeOwnershipReleaseResponse (
    in ObjectHandle      theObject,
    in AttributeHandleSet theAttributes)
raises (
    ObjectNotKnown,
    AttributeNotDefined,
    AttributeNotOwned,
    FederateWasNotAskedToReleaseAttribute,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 7.12
void cancelNegotiatedAttributeOwnershipDivestiture (
    in ObjectHandle      theObject,
    in AttributeHandleSet theAttributes)
raises (
    ObjectNotKnown,
    AttributeNotDefined,
    AttributeNotOwned,
    AttributeDivestitureWasNotRequested,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 7.13
void cancelAttributeOwnershipAcquisition (
    in ObjectHandle      theObject,

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```

    in AttributeHandleSet theAttributes)
raises (
    ObjectNotKnown,
    AttributeNotDefined,
    AttributeAlreadyOwned,
    AttributeAcquisitionWasNotRequested,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 7.15
void queryAttributeOwnership (
    in ObjectHandle theObject,
    in AttributeHandle theAttribute)
raises (
    ObjectNotKnown,
    AttributeNotDefined,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 7.17
Boolean
isAttributeOwnedByFederate (
    in ObjectHandle theObject,
    in AttributeHandle theAttribute)
raises (
    ObjectNotKnown,
    AttributeNotDefined,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

////////////////////////
// Time Management Services //
////////////////////////

// 8.2
void enableTimeRegulation (
    in FederationTime theFederateTime,
    in FederationTime theLookahead)
raises (
    TimeRegulationAlreadyEnabled,
    EnableTimeRegulationPending,
    TimeAdvanceAlreadyInProgress,
    InvalidFederationTime,
    InvalidLookahead,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 8.4
void disableTimeRegulation ()
raises (
    TimeRegulationWasNotEnabled,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

// 8.5
void enableTimeConstrained ()
raises (
    TimeConstrainedAlreadyEnabled,
    EnableTimeConstrainedPending,
    TimeAdvanceAlreadyInProgress,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTInternalError);

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```
// 8.7
void disableTimeConstrained ()
raises (
    TimeConstrainedWasNotEnabled,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 8.8
void timeAdvanceRequest (
    in FederationTime theTime)
raises (
    InvalidFederationTime,
    FederationTimeAlreadyPassed,
    TimeAdvanceAlreadyInProgress,
    EnableTimeRegulationPending,
    EnableTimeConstrainedPending,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 8.9
void timeAdvanceRequestAvailable (
    in FederationTime theTime)
raises (
    InvalidFederationTime,
    FederationTimeAlreadyPassed,
    TimeAdvanceAlreadyInProgress,
    EnableTimeRegulationPending,
    EnableTimeConstrainedPending,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 8.10
void nextEventRequest (
    in FederationTime theTime)
raises (
    InvalidFederationTime,
    FederationTimeAlreadyPassed,
    TimeAdvanceAlreadyInProgress,
    EnableTimeRegulationPending,
    EnableTimeConstrainedPending,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 8.11
void nextEventRequestAvailable (
    in FederationTime theTime)
raises (
    InvalidFederationTime,
    FederationTimeAlreadyPassed,
    TimeAdvanceAlreadyInProgress,
    EnableTimeRegulationPending,
    EnableTimeConstrainedPending,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 8.12
void flushQueueRequest (
    in FederationTime theTime)
raises (
    InvalidFederationTime,
    FederationTimeAlreadyPassed,
    TimeAdvanceAlreadyInProgress,
    EnableTimeRegulationPending,
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    EnableTimeConstrainedPending,  
    FederateNotExecutionMember,  
    SaveInProgress,  
    RestoreInProgress,  
    RTIInternalError);  
  
// 8.14  
void enableAsynchronousDelivery()  
    raises (  
        AsynchronousDeliveryAlreadyEnabled,  
        FederateNotExecutionMember,  
        SaveInProgress,  
        RestoreInProgress,  
        RTIInternalError);  
  
// 8.15  
void disableAsynchronousDelivery()  
    raises (  
        AsynchronousDeliveryAlreadyDisabled,  
        FederateNotExecutionMember,  
        SaveInProgress,  
        RestoreInProgress,  
        RTIInternalError);  
  
// 8.16  
void queryLBTS (  
    out FederationTime theTime)  
    raises (  
        FederateNotExecutionMember,  
        SaveInProgress,  
        RestoreInProgress,  
        RTIInternalError);  
  
// 8.17  
void queryFederateTime (  
    out FederationTime theTime)  
    raises (  
        FederateNotExecutionMember,  
        SaveInProgress,  
        RestoreInProgress,  
        RTIInternalError);  
  
// 8.18  
void queryMinNextEventTime (  
    out FederationTime theTime)  
    raises (  
        FederateNotExecutionMember,  
        SaveInProgress,  
        RestoreInProgress,  
        RTIInternalError);  
  
// 8.19  
void modifyLookahead (  
    in FederationTime theLookahead)  
    raises (  
        InvalidLookahead,  
        FederateNotExecutionMember,  
        SaveInProgress,  
        RestoreInProgress,  
        RTIInternalError);  
  
// 8.20  
void queryLookahead (  
    out FederationTime theTime)  
    raises (  
        FederateNotExecutionMember,  
        SaveInProgress,  
        RestoreInProgress,  
        RTIInternalError);  
  
// 8.21  
void retract (  
    in EventRetractionHandle theHandle)  
    raises (  

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```

    InvalidRetractionHandle,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIInternalError);

// 8.23
void changeAttributeOrderType (
    in ObjectHandle      theObject,
    in AttributeHandleSet theAttributes,
    in OrderingHandle     theType)
raises (
    ObjectNotKnown,
    AttributeNotDefined,
    AttributeNotOwned,
    InvalidOrderingHandle,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIInternalError);

// 8.24
void changeInteractionOrderType (
    in InteractionClassHandle theClass,
    in OrderingHandle         theType)
raises (
    InteractionClassNotDefined,
    InteractionClassNotPublished,
    InvalidOrderingHandle,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIInternalError);

////////////////////
// Data Distribution Management //
////////////////////

// 9.2
Region
createRegion (
    in SpaceHandle theSpace,
    in ULong        numberOfExtents)
raises (
    SpaceNotDefined,
    InvalidExtents,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIInternalError);

// 9.3
void notifyAboutRegionModification (
    in Region theRegion)
raises (
    RegionNotKnown,
    InvalidExtents,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIInternalError);

// 9.4
void deleteRegion (
    in Region theRegion)
raises (
    RegionNotKnown,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIInternalError);

// 9.5
ObjectHandle

```

```

registerObjectInstanceWithRegionAndName (
    in ObjectClassHandle      theClass,
    in ObjectName             theObject,
    in sequence<AttributeHandle> theAttributes,
    in sequence<Region>       theRegions,
    in ULONG                  theNumberOfHandles)
raises (
    ObjectClassNotDefined,
    ObjectClassNotPublished,
    ObjectAlreadyRegistered,
    RegionNotKnown,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

ObjectHandle
registerObjectInstanceWithRegion (
    in ObjectClassHandle      theClass,
    in sequence<AttributeHandle> theAttributes,
    in sequence<Region>       theRegions,
    in ULONG                  theNumberOfHandles)
raises (
    ObjectClassNotDefined,
    ObjectClassNotPublished,
    RegionNotKnown,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 9.6
void associateRegionForUpdates (
    in Region      theRegion,
    in ObjectHandle theObject,
    in AttributeHandleSet theAttributes)
raises (
    ObjectNotKnown,
    AttributeNotDefined,
    InvalidRegionContext,
    RegionNotKnown,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 9.7
void unassociateRegionForUpdates (
    in Region      theRegion,
    in ObjectHandle theObject)
raises (
    ObjectNotKnown,
    InvalidRegionContext,
    RegionNotKnown,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 9.8
void subscribeObjectClassAttributesWithRegion (
    in ObjectClassHandle theClass,
    in Region            theRegion,
    in AttributeHandleSet attributeList,
    in Boolean           active)
raises (
    ObjectClassNotDefined,
    AttributeNotDefined,
    RegionNotKnown,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

```

```

// 9.9
void unsubscribeObjectClassWithRegion (
    in ObjectClassHandle theClass,
    in Region             theRegion)
raises (
    ObjectClassNotDefined,
    RegionNotKnown,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 9.10
void subscribeInteractionClassWithRegion (
    in InteractionClassHandle theClass,
    in Region                 theRegion,
    in Boolean                 active)
raises (
    InteractionClassNotDefined,
    RegionNotKnown,
    FederateLoggingServiceCalls,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 9.11
void unsubscribeInteractionClassWithRegion (
    in InteractionClassHandle theClass,
    in Region                 theRegion)
raises (
    InteractionClassNotDefined,
    InteractionClassNotSubscribed,
    RegionNotKnown,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 9.12
EventRetractionHandle
sendInteractionWithRegionAndTime (
    in InteractionClassHandle theInteraction,
    in ParameterHandleValuePairSet theParameters,
    in FederationTime         theTime,
    in UserSuppliedTag        theTag,
    in Region                  theRegion)
raises (
    InteractionClassNotDefined,
    InteractionClassNotPublished,
    InteractionParameterNotDefined,
    InvalidFederationTime,
    RegionNotKnown,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

void sendInteractionWithRegion (
    in InteractionClassHandle theInteraction,
    in ParameterHandleValuePairSet theParameters,
    in UserSuppliedTag        theTag,
    in Region                  theRegion)
raises (
    InteractionClassNotDefined,
    InteractionClassNotPublished,
    InteractionParameterNotDefined,
    RegionNotKnown,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

// 9.13

```



```

void requestClassAttributeValueUpdateWithRegion (
    in ObjectClassHandle    theClass,
    in AttributeHandleSet    theAttributes,
    in Region                theRegion)
raises (
    ObjectClassNotDefined,
    AttributeNotDefined,
    RegionNotKnown,
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIinternalError);

//////////
// RTI Support Services //
//////////

// 10.2
ObjectClassHandle
getObjectClassHandle (
    in ObjectClassName theName)
raises (
    NameNotFound,
    FederateNotExecutionMember,
    RTIinternalError);

// 10.3
ObjectClassName
getObjectClassName (
    in ObjectClassHandle theHandle)
raises (
    ObjectClassNotDefined,
    FederateNotExecutionMember,
    RTIinternalError);

// 10.4
AttributeHandle
getAttributeHandle (
    in AttributeName    theName,
    in ObjectClassHandle whichClass)
raises (
    ObjectClassNotDefined,
    NameNotFound,
    FederateNotExecutionMember,
    RTIinternalError);

// 10.5
AttributeName
getAttributeName (
    in AttributeHandle    theHandle,
    in ObjectClassHandle whichClass)
raises (
    ObjectClassNotDefined,
    AttributeNotDefined,
    FederateNotExecutionMember,
    RTIinternalError);

// 10.6
InteractionClassHandle
getInteractionClassHandle (
    in InteractionClassName theName)
raises (
    NameNotFound,
    FederateNotExecutionMember,
    RTIinternalError);

// 10.7
InteractionClassName
getInteractionClassName (
    in InteractionClassHandle theHandle)
raises (
    InteractionClassNotDefined,
    FederateNotExecutionMember,
    RTIinternalError);

```

```

// 10.8
ParameterHandle
getParameterHandle (
    in ParameterName theName,
    in InteractionClassHandle whichClass)
raises (
    InteractionClassNotDefined,
    NameNotFound,
    FederateNotExecutionMember,
    RTIInternalError);

// 10.9
ParameterName
getParameterName (
    in ParameterHandle theHandle,
    in InteractionClassHandle whichClass)
raises (
    InteractionClassNotDefined,
    InteractionParameterNotDefined,
    FederateNotExecutionMember,
    RTIInternalError);

// 10.10
ObjectHandle
getObjectInstanceHandle (
    in ObjectName theName)
raises (
    ObjectNotKnown,
    FederateNotExecutionMember,
    RTIInternalError);

// 10.11
ObjectName
getObjectInstanceName (
    in ObjectHandle theHandle)
raises (
    ObjectNotKnown,
    FederateNotExecutionMember,
    RTIInternalError);

// 10.12
SpaceHandle
getRoutingSpaceHandle (
    in SpaceName theName)
raises (
    NameNotFound,
    FederateNotExecutionMember,
    RTIInternalError);

// 10.13
SpaceName
getRoutingSpaceName (
    in SpaceHandle theHandle)
raises (
    SpaceNotDefined,
    FederateNotExecutionMember,
    RTIInternalError);

// 10.14
DimensionHandle
getDimensionHandle (
    in DimensionName theName,
    in SpaceHandle whichSpace)
raises (
    SpaceNotDefined,
    NameNotFound,
    FederateNotExecutionMember,
    RTIInternalError);

// 10.15
DimensionName
getDimensionName (
    in DimensionHandle theHandle,

```

```

    in SpaceHandle      whichSpace)
raises (
    SpaceNotDefined,
    DimensionNotDefined,
    FederateNotExecutionMember,
    RTIinternalError);

// 10.16
SpaceHandle
getAttributeRoutingSpaceHandle (
    in AttributeHandle  theHandle,
    in ObjectClassHandle whichClass)
raises (
    ObjectClassNotDefined,
    AttributeNotDefined,
    FederateNotExecutionMember,
    RTIinternalError);

// 10.17
ObjectClassHandle
getObjectClass (
    in ObjectHandle theObject)
raises (
    ObjectNotKnown,
    FederateNotExecutionMember,
    RTIinternalError);

// 10.18
SpaceHandle
getInteractionRoutingSpaceHandle (
    in InteractionClassHandle theHandle)
raises (
    InteractionClassNotDefined,
    FederateNotExecutionMember,
    RTIinternalError);

// 10.19
TransportationHandle
getTransportationHandle (
    in TransportationName theName)
raises (
    NameNotFound,
    FederateNotExecutionMember,
    RTIinternalError);

// 10.20
TransportationName
getTransportationName (
    in TransportationHandle theHandle)
raises (
    InvalidTransportationHandle,
    FederateNotExecutionMember,
    RTIinternalError);

// 10.21
OrderingHandle
getOrderingHandle (
    in OrderingName theName)
raises (
    NameNotFound,
    FederateNotExecutionMember,
    RTIinternalError);

// 10.22
OrderingName
getOrderingName (
    in OrderingHandle theHandle)
raises (
    InvalidOrderingHandle,
    FederateNotExecutionMember,
    RTIinternalError);

// 10.23
void enableClassRelevanceAdvisorySwitch()

```

```
raises(
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIInternalError);

// 10.24
void disableClassRelevanceAdvisorySwitch()
raises(
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIInternalError);

// 10.25
void enableAttributeRelevanceAdvisorySwitch()
raises(
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIInternalError);

// 10.26
void disableAttributeRelevanceAdvisorySwitch()
raises(
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIInternalError);

// 10.27
void enableAttributeScopeAdvisorySwitch()
raises(
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIInternalError);

// 10.28
void disableAttributeScopeAdvisorySwitch()
raises(
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIInternalError);

// 10.29
void enableInteractionRelevanceAdvisorySwitch()
raises(
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIInternalError);

// 10.30
void disableInteractionRelevanceAdvisorySwitch()
raises(
    FederateNotExecutionMember,
    SaveInProgress,
    RestoreInProgress,
    RTIInternalError);

#endif /* _RTI_AMB_SERVICES_IDL_ */
```

```

//File:fed_amb_services.idl
//included in RTI.idl
//Defines the methods on the interface FederateAmbassador
//in module RTI

#if !defined(_FED_AMB_SERVICES_IDL_)
#define _FED_AMB_SERVICES_IDL_

////////////////////////////////////////
// Federation Management Services //
////////////////////////////////////////

// 4.7
void synchronizationPointRegistrationSucceeded (
    in SynchronizationPointLabel label)
raises (
    FederateInternalError);

void synchronizationPointRegistrationFailed (
    in SynchronizationPointLabel label)
raises (
    FederateInternalError);

// 4.8
void announceSynchronizationPoint (
    in SynchronizationPointLabel label,
    in UserSuppliedTag tag)
raises (
    FederateInternalError);

// 4.10
void federationSynchronized (
    in SynchronizationPointLabel label)
raises (
    FederateInternalError);

// 4.12
void initiateFederateSave (
    in SaveLabel label)
raises (
    UnableToPerformSave,
    FederateInternalError);

// 4.15
void federationSaved ()
raises (
    FederateInternalError);

void federationNotSaved ()
raises (
    FederateInternalError);

// 4.17
void requestFederationRestoreSucceeded (
    in SaveLabel label)
raises (
    FederateInternalError);

void requestFederationRestoreFailed (
    in SaveLabel label)
raises (
    FederateInternalError);

// 4.18
void federationRestoreBegun ()
raises (
    FederateInternalError);

// 4.19
void initiateFederateRestore (
    in SaveLabel label,
    in FederateHandle handle)

```

```

raises (
    SpecifiedSaveLabelDoesNotExist,
    CouldNotRestore,
    FederateInternalError);

// 4.21
void federationRestored ()
raises (
    FederateInternalError);

void federationNotRestored ()
raises (
    FederateInternalError);

////////////////////////////////////
// Declaration Management Services //
////////////////////////////////////

// 5.10
void startRegistrationForObjectClass (
    in ObjectClassHandle theClass)
raises (
    ObjectClassNotPublished,
    FederateInternalError);

// 5.11
void stopRegistrationForObjectClass (
    in ObjectClassHandle theClass)
raises (
    ObjectClassNotPublished,
    FederateInternalError);

// 5.12
void turnInteractionsOn (
    in InteractionClassHandle theHandle)
raises (
    InteractionClassNotPublished,
    FederateInternalError);

// 5.13
void turnInteractionsOff (
    in InteractionClassHandle theHandle)
raises (
    InteractionClassNotPublished,
    FederateInternalError);

////////////////////////////////////
// Object Management Services //
////////////////////////////////////

// 6.3
void discoverObjectInstance (
    in ObjectHandle theObject,
    in ObjectClassHandle theObjectClass)
raises (
    CouldNotDiscover,
    ObjectClassNotKnown,
    FederateInternalError);

// 6.5
void reflectAttributeValuesWithTime (
    in ObjectHandle theObject,
    in AttributeHandleValuePairSet theAttributes,
    in FederationTime theTime,
    in UserSuppliedTag theTag,
    in EventRetractionHandle theHandle)
raises (
    ObjectNotKnown,
    AttributeNotKnown,
    FederateOwnsAttributes,
    InvalidFederationTime,
    FederateInternalError);

void reflectAttributeValues (

```

```

    in ObjectHandle           theObject,
    in AttributeHandleValuePairSet theAttributes,
    in UserSuppliedTag       theTag)
raises (
    ObjectNotKnown,
    AttributeNotKnown,
    FederateOwnsAttributes,
    FederateInternalError);

// 6.7
void receiveInteractionWithTime (
    in InteractionClassHandle theInteraction,
    in ParameterHandleValuePairSet theParameters,
    in FederationTime         theTime,
    in UserSuppliedTag        theTag,
    in EventRetractionHandle  theHandle)
raises (
    InteractionClassNotKnown,
    InteractionParameterNotKnown,
    InvalidFederationTime,
    FederateInternalError);

void receiveInteraction (
    in InteractionClassHandle theInteraction,
    in ParameterHandleValuePairSet theParameters,
    in UserSuppliedTag        theTag)
raises (
    InteractionClassNotKnown,
    InteractionParameterNotKnown,
    FederateInternalError);

// 6.9
void removeObjectInstanceWithTime (
    in ObjectHandle           theObject,
    in FederationTime         theTime,
    in UserSuppliedTag        theTag,
    in EventRetractionHandle  theHandle)
raises (
    ObjectNotKnown,
    InvalidFederationTime,
    FederateInternalError);

void removeObjectInstance (
    in ObjectHandle           theObject,
    in UserSuppliedTag        theTag)
raises (
    ObjectNotKnown,
    FederateInternalError);

// 6.13
void attributesInScope (
    in ObjectHandle           theObject,
    in AttributeHandleSet     theAttributes)
raises (
    ObjectNotKnown,
    AttributeNotKnown,
    FederateInternalError);

// 6.14
void attributesOutOfScope (
    in ObjectHandle           theObject,
    in AttributeHandleSet     theAttributes)
raises (
    ObjectNotKnown,
    AttributeNotKnown,
    FederateInternalError);

// 6.16
void provideAttributeValueUpdate (
    in ObjectHandle           theObject,
    in AttributeHandleSet     theAttributes)
raises (
    ObjectNotKnown,
    AttributeNotKnown,

```

```

    AttributeNotOwned,
    FederateInternalError);

// 6.17
void turnUpdatesOnForObjectInstance (
    in ObjectHandle      theObject,
    in AttributeHandleSet theAttributes)
raises (
    ObjectNotKnown,
    AttributeNotOwned,
    FederateInternalError);

// 6.18
void turnUpdatesOffForObjectInstance (
    in ObjectHandle      theObject,
    in AttributeHandleSet theAttributes)
raises (
    ObjectNotKnown,
    AttributeNotOwned,
    FederateInternalError);

////////////////////
// Ownership Management Services //
////////////////////

// 7.4
void requestAttributeOwnershipAssumption (
    in ObjectHandle      theObject,
    in AttributeHandleSet offeredAttributes,
    in UserSuppliedTag   theTag)
raises (
    ObjectNotKnown,
    AttributeNotKnown,
    AttributeAlreadyOwned,
    AttributeNotPublished,
    FederateInternalError);

// 7.5
void attributeOwnershipDivestitureNotification (
    in ObjectHandle      theObject,
    in AttributeHandleSet releasedAttributes)
raises (
    ObjectNotKnown,
    AttributeNotKnown,
    AttributeNotOwned,
    AttributeDivestitureWasNotRequested,
    FederateInternalError);

// 7.6
void attributeOwnershipAcquisitionNotification (
    in ObjectHandle      theObject,
    in AttributeHandleSet securedAttributes)
raises (
    ObjectNotKnown,
    AttributeNotKnown,
    AttributeAcquisitionWasNotRequested,
    AttributeAlreadyOwned,
    AttributeNotPublished,
    FederateInternalError);

// 7.9
void attributeOwnershipUnavailable (
    in ObjectHandle      theObject,
    in AttributeHandleSet theAttributes)
raises (
    ObjectNotKnown,
    AttributeNotKnown,
    AttributeAlreadyOwned,
    AttributeAcquisitionWasNotRequested,
    FederateInternalError);

// 7.10
void requestAttributeOwnershipRelease (
    in ObjectHandle      theObject,

```



```

    in AttributeHandleSet  candidateAttributes,
    in UserSuppliedTag     theTag)
raises (
    ObjectNotKnown,
    AttributeNotKnown,
    AttributeNotOwned,
    FederateInternalError);

// 7.14
void confirmAttributeOwnershipAcquisitionCancellation (
    in ObjectHandle        theObject,
    in AttributeHandleSet  theAttributes)
raises (
    ObjectNotKnown,
    AttributeNotKnown,
    AttributeAlreadyOwned,
    AttributeAcquisitionWasNotCanceled,
    FederateInternalError);

// 7.16
void informAttributeOwnership (
    in ObjectHandle        theObject,
    in AttributeHandle     theAttribute,
    in FederateHandle      theOwner)
raises (
    ObjectNotKnown,
    AttributeNotKnown,
    FederateInternalError);

void attributeIsNotOwned (
    in ObjectHandle        theObject,
    in AttributeHandle     theAttribute)
raises (
    ObjectNotKnown,
    AttributeNotKnown,
    FederateInternalError);

void attributeOwnedByRTI (
    in ObjectHandle        theObject,
    in AttributeHandle     theAttribute)
raises (
    ObjectNotKnown,
    AttributeNotKnown,
    FederateInternalError);

////////////////////
// Time Management Services //
////////////////////

// 8.3
void timeRegulationEnabled (
    in FederationTime      theFederateTime)
raises (
    InvalidFederationTime,
    EnableTimeRegulationWasNotPending,
    FederateInternalError);

// 8.6
void timeConstrainedEnabled (
    in FederationTime      theFederateTime)
raises (
    InvalidFederationTime,
    EnableTimeConstrainedWasNotPending,
    FederateInternalError);

// 8.13
void timeAdvanceGrant (
    in FederationTime      theTime)
raises (
    InvalidFederationTime,
    TimeAdvanceWasNotInProgress,
    FederateInternalError);

// 8.22

```

```
void requestRetraction (  
    in EventRetractionHandle theHandle)  
raises (  
    EventNotKnown,  
    FederateInternalError);  
  
#endif /* _FED_AMB_SERVICES_IDL_ */
```