



# H.L.A.

## Part V

Time  
Management

Federation  
Services  
Management



# H.L.A.

## Part V

Time  
Management

Federation  
Services  
Management

# The Time:

## Simulator Types

- ◆ Simulation Models are classified into two types:
  - Continuous
  - Discrete
- ◆ Types of Simulation Implementations:
  - Event Driven Implementation
  - Time-Stepped Implementation
  - Real-Time Implementation
  - Scaled Real-Time Implementation
  - Non Real-Time Implementation



# H.L.A.

## Part V

### Simulator Types

### Time-Stepped Example

### Time Management

### Federation Services Management

# The Time:

- ◆ Continuous Model of a Discrete Process
- ◆ Time-Stepped Implementation
- ◆ Uses Events to Communicate Existence of Countries
- ◆ Original Model Built, it's assumed that each Federate starts at time0

# H.L.A.

## Part V

Simulator  
Types

Time-Stepped  
Example

Time  
Management  
Schedule

Time  
Management

Federation  
Services  
Management

# The Time:

- ◆ No Time Management exists:
  - Each Federate advances time at its own pace
- ◆ Conservative Synchronization
  - Federates advance time only when guaranteed that no past data will be received
- ◆ Optimistic Synchronization
  - Free to advance logical time, may have a Roll-Back
- ◆ Active Scan
  - Advance Time by Mutual Agreement With Other Federates

# H.L.A.

## Part V

Time  
Management

Federation  
Services  
Management

# The Time:

Simulators

Types

Time-Stepped  
Example

Time

Management  
Schedule

Logical Time  
Restrictions

- ◆ Initial Value
- ◆ Value Not Tied to Any Measure Units System
- ◆ Well ordered
- ◆ Always greater or equal than the initial time
- ◆ The time is effectively discrete
- ◆ A special value exists, it's called Positive Infinite and it is greater than any other value

# H.L.A.

## Part V

Time Management

Federation Services Management

# The Time:

Simulators

Types

Time-Stepped Example

Time

Management Schedule

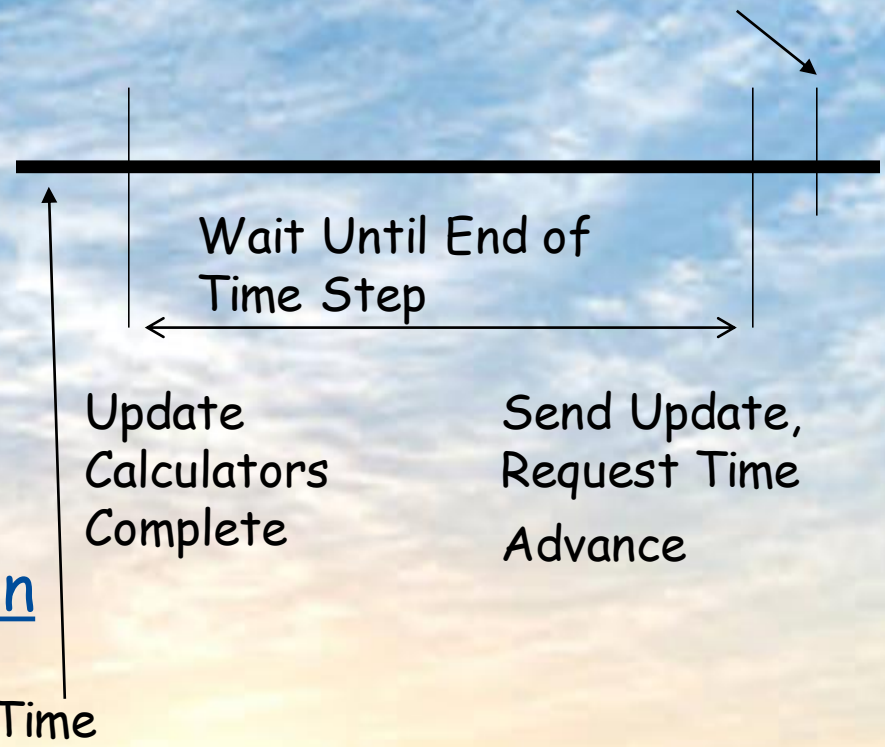
Logical Time Restrictions

Logical Time Synchronization

Current Logical Time

◆ Case 1

Update Delayed Until Clock Advances to End of Time-Step



# H.L.A.

## Part V

Time  
Management

Federation  
Services  
Management

# The Time:

Simulator

Types

Time-Stepped  
Example

Time

Management

Schedule L.T. corr.

Logical Time

Restrictions

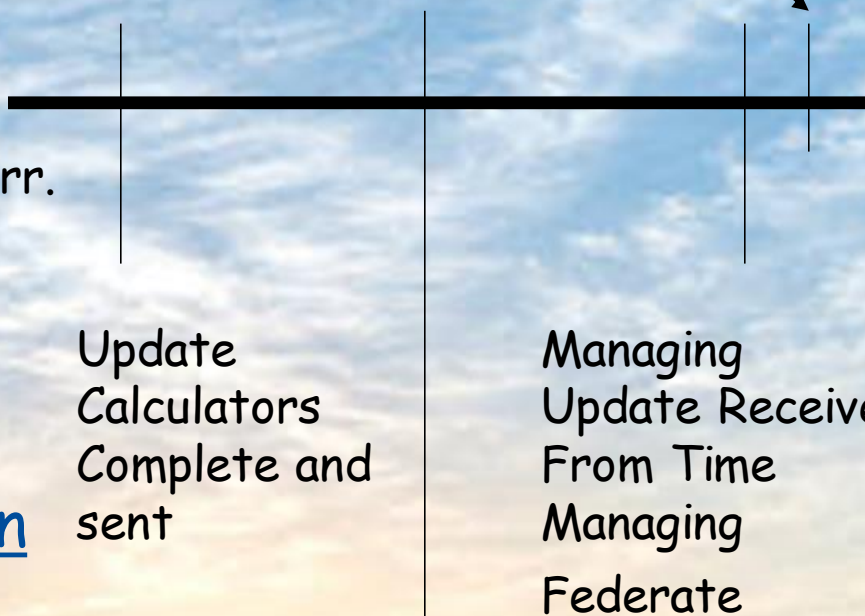
Logical Time

Synchronization

◆ Case 2

Update Delayed Until Clock  
Advances to End of Time-  
Step

Time Advance Granted



All Data Received For This  
Time Step



# H.L.A.

## Part V

Time  
Management

Federation  
Services  
Management

# The Time:

Simulator

Types

Time-Stepped  
Example

Time

Management

Schedule

Logical Time  
Restrictions

Logical Time  
Synchronization

Events

◆ Sending Events

- Update Attribute Values
- Send Interaction
- Delete Object Instance

◆ Receiving Events

- Reflect Attribute Values
- Reflect Interaction
- Remove Object Instance

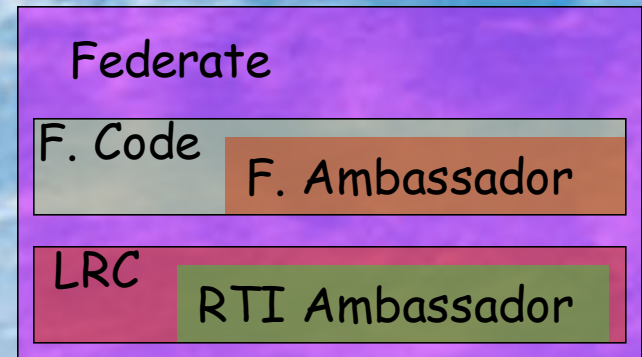
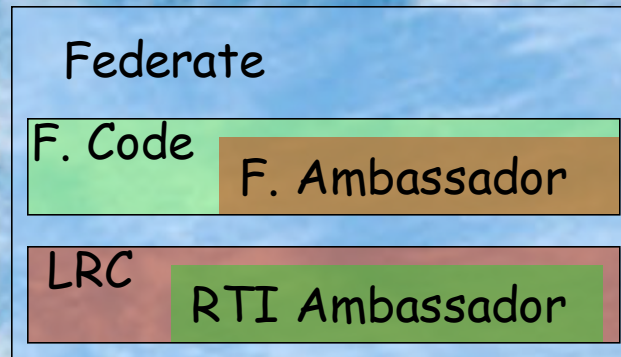


# H.L.A.

## Part V

# Federation:

## Life Cycle Management



Time  
Management

createFederationExecution

RTI

joinFederationExecution

joinFederationExecution

resignFederationExecution

resignFederationExecution

Federation  
Services  
Management

destryFederationExecution

# H.L.A.

## Part V

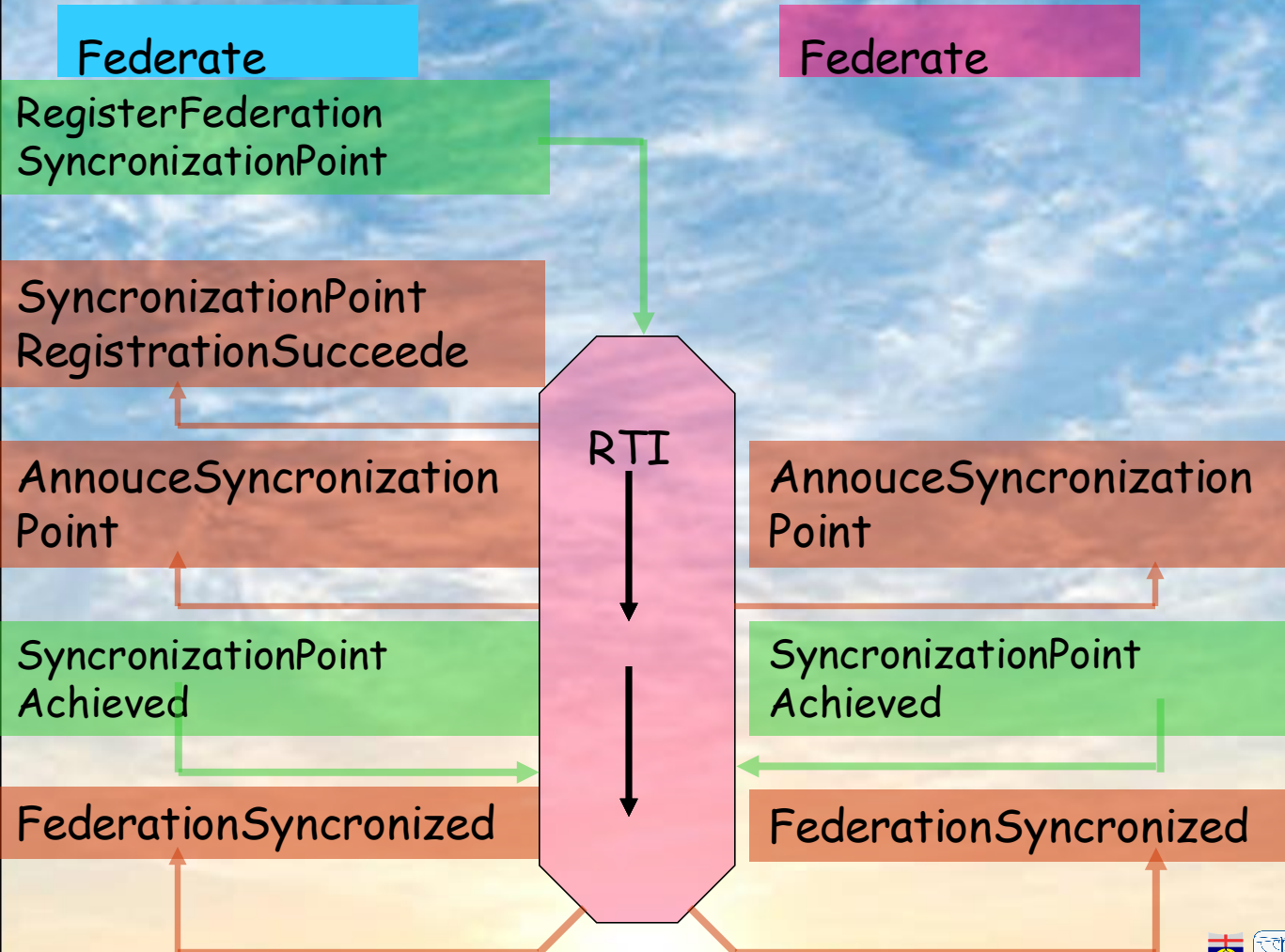
# Federation:

## Life Cycle Management

## Synchronization Management

Time  
Management

Federation  
Services  
Management



# H.L.A.

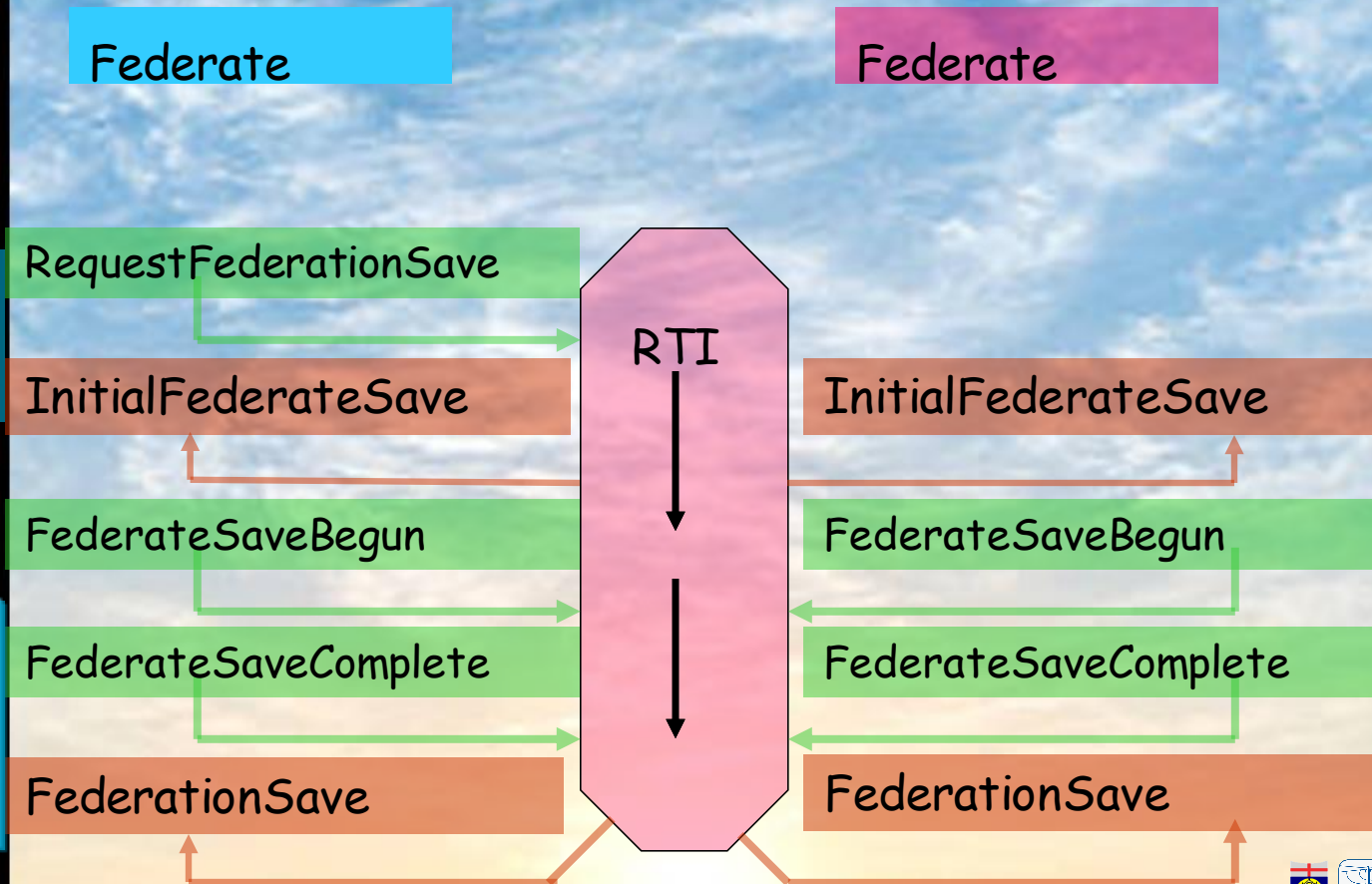
## Part V

Time Management

Federation Services Management

# Federation:

Life Cycle Management  
Synchronization Management  
Save Management



# H.L.A.

## Part V

# Federation:

Cycle Management

Synchronization Management

Save Management

Restore Management

Federate

Federate

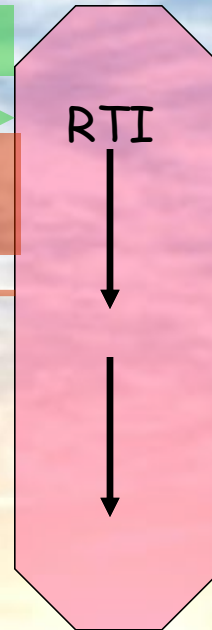
Time  
Management

Federation  
Services  
Management

RequestFederationRestore

RequestFederationRestore  
Succeeded

RTI



# H.L.A.

## Part V

# Federation:

- Life Cycle Management
- Synchronization Management
- Save Management
- Restore Management

Federate

Federate

Time  
Management

Federation  
Services  
Management

