Update of Academic Outreach Program

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Goals of the Academic Outreach Program

- **Educate undergraduate and graduate students about HLA**
  - **Create job opportunities for students**
  - **Create talent pool for HLA community**
- **Inform academic researchers about HLA research opportunities**
  - **Open new research areas for researchers**
  - **Tap into pool of experienced simulation researchers to generate “next generation” solutions**
- **Work in conjunction with an academic organization established in simulation**
  - **SCS McLeod Institute of Simulation Sciences at CSU Chico**

Approach

- **Develop initial course materials**
- **Provide tools**
  - **DMSO developed tools**
  - **RTI kit**
  - **Solicit university discounts from commercial tool vendors**
- **Initiate university contact network**
  - **Identify current and interested university participants**
  - **Develop email list**
  - **Collect and share contact information and research interests**
- **Establish an information repository (www.ecst.csuchico.edu/~mcleod)**
  - **On-line bibliography**
  - **Download page for course materials**
  - **Vendor discount information**
  - **Contact information and links**

Course Materials - Module 1

- **Fundamentals of HLA**
- **Presentation materials, detailed course notes, reading recommendations, lab exercises**
- **Designed to be taught as a series in a simulation, distributed systems, or operations research/analysis course**
- **Complete and available on the web page**
- **Topics**
  - **Introduction to HLA**
  - **RTI interfaces and components of a federation**
  - **OMT**
  - **A federate using Hello World as an example**
  - **Declaration Management and Object Management**
  - **Time Management and types of time management strategies**

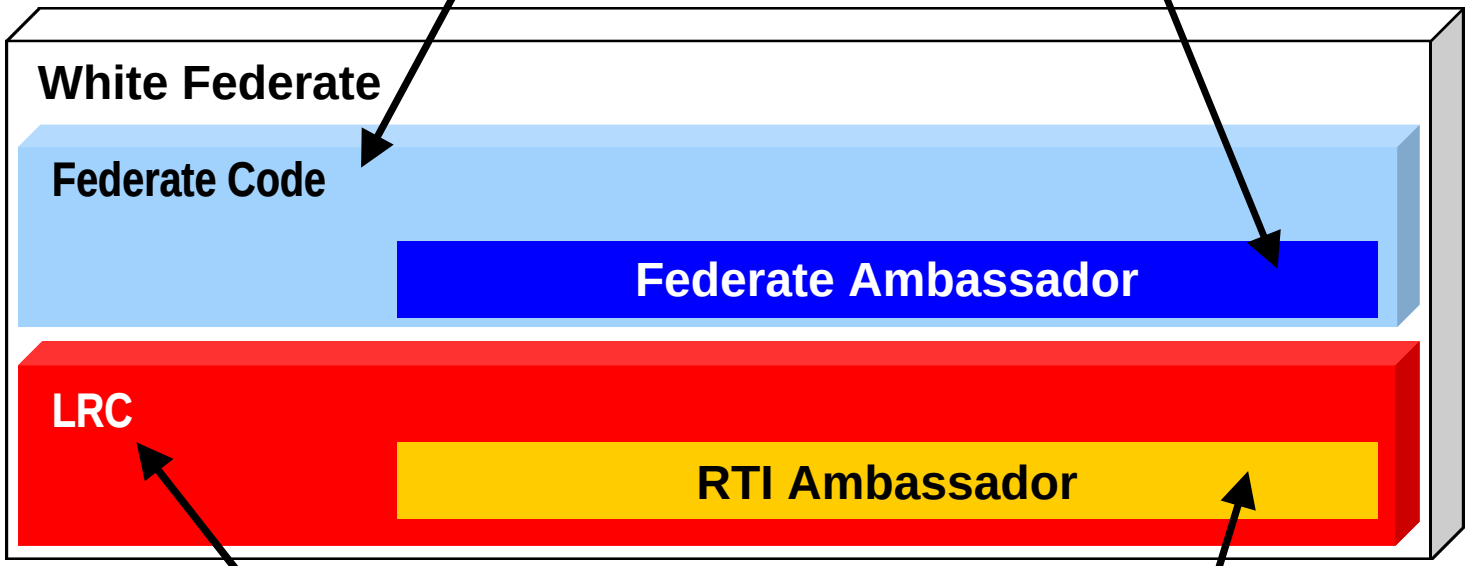
Course Materials - Module 2

- Advanced topics
- Presentation materials, brief course notes, reading recommendations
- Designed to be taught individually as appropriate
- Topics outlined and presentation materials in parallel development
- Topics
  - DDM
  - TM
  - MOM
  - FEDEP
  - DIF and FED
  - Tools

What's in a Federate?

The Federate's Code provides internal functionality.

The Federate's code must define the abstract RTI::FederateAmbassador class

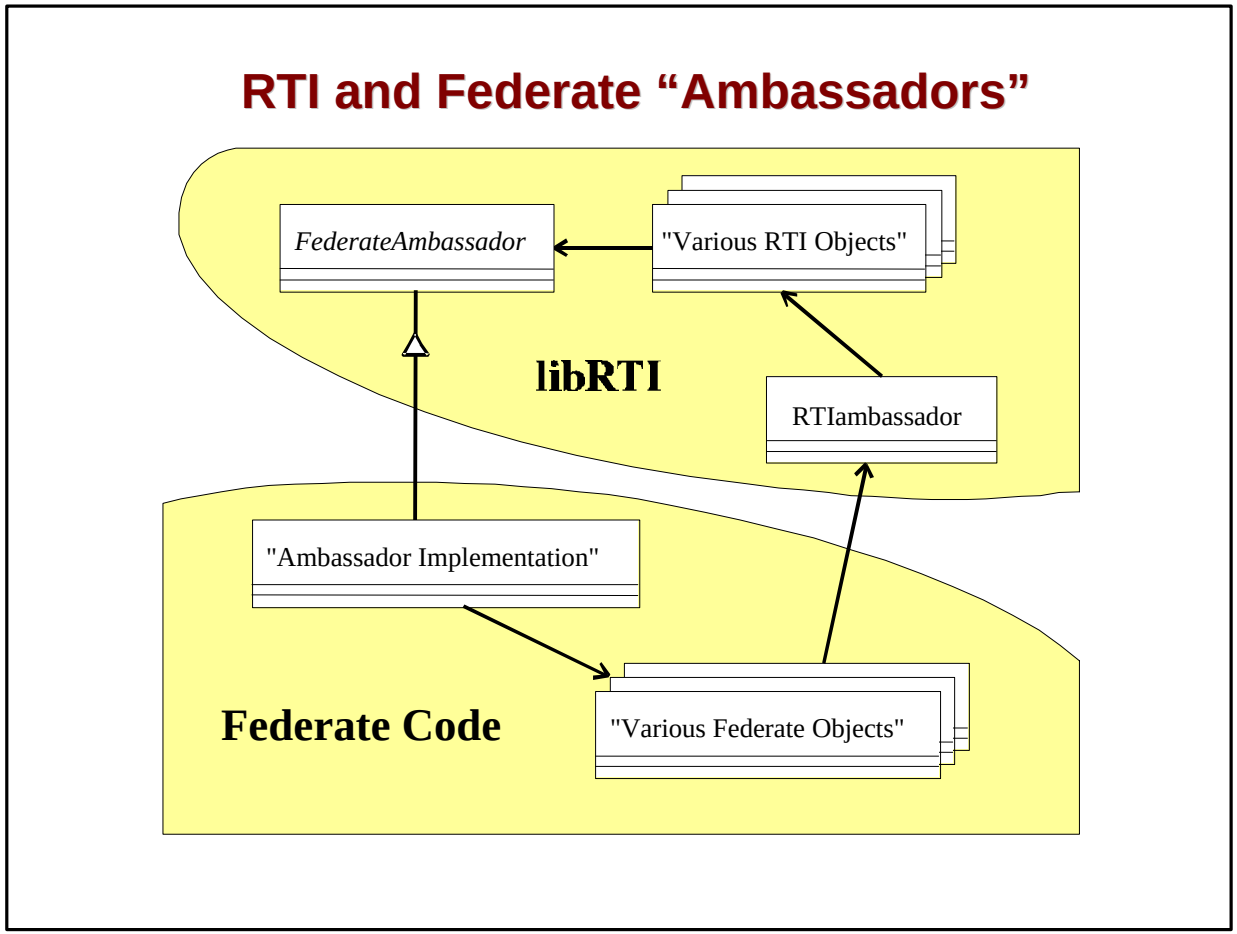


The Local RTI Components (LRC) provide external functionality as specified by the IFSpec.

The LRC include the methods for the RTI::RTIAmbassador class

(Figure from the Hands-on Practicum)

RTI and Federate Ambassadors



(Figure from the Hands-on Practicum)

Content of an IF Specification

- Interface Name and Brief Description of Service
- Supplied Arguments
- Returned Arguments
- Pre Conditions
- Post Conditions
- Exceptions
- Related Services

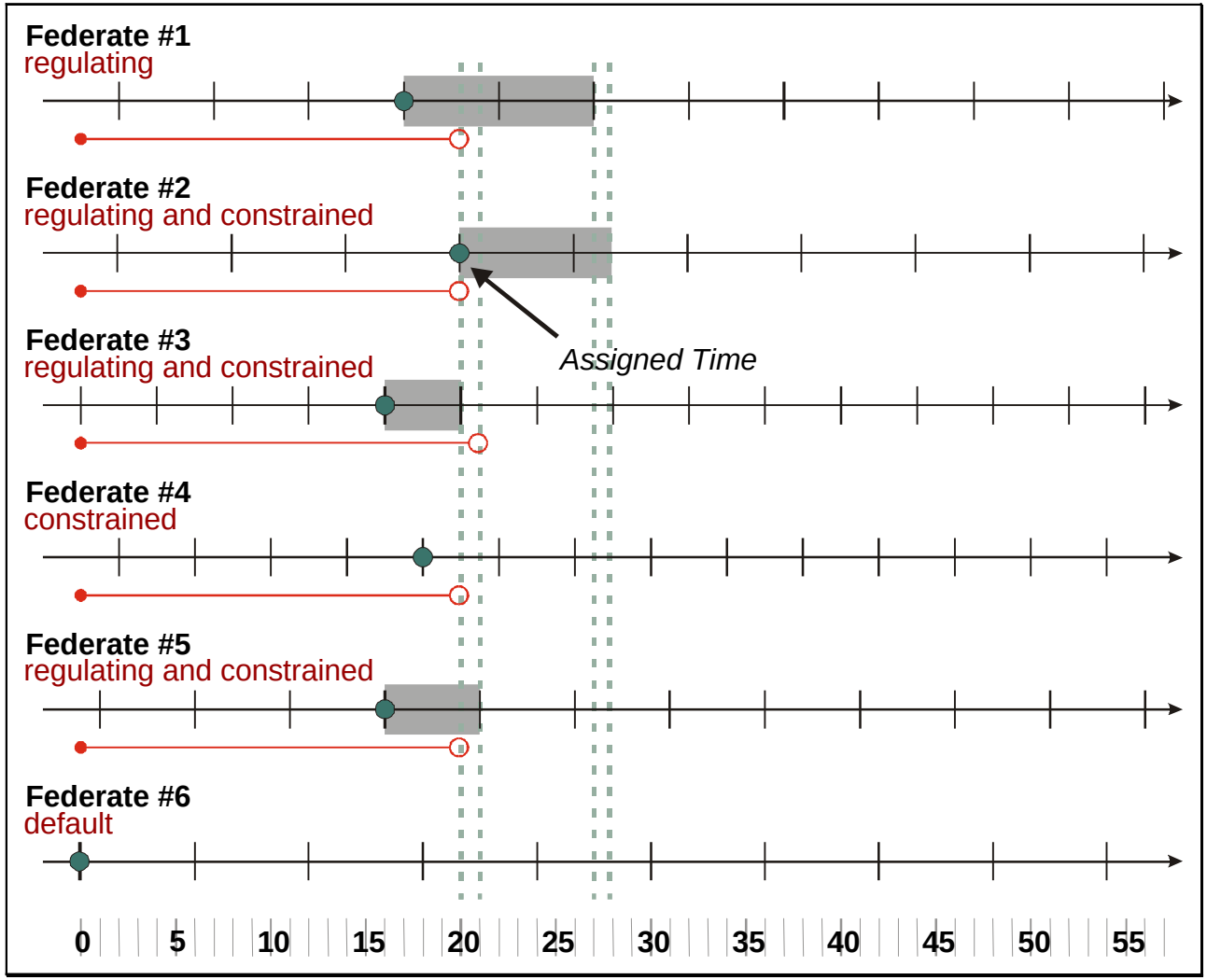
Sample RTI Service Request

```
try
{
  rtiAmb.timeAdvanceRequest(requestTime);
}
catch (RTI::Exception& e)
{
  cerr << "FED_HW: ERROR: " << &e << endl;
}
```

Time Management Schemes

- No Time Management
  - 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 Roll-back
- Activity Scan
  - Advance Time by Mutual Agreement With Other Federates

Late Arriving Federate



What's Next?

- Complete module 2
- Add web page for vendor discounts
- Solicit input for contact page
- Solicit feedback on module 1
- Assemble research materials package
  - Federate and federation source code
  - RTI Kit
  - CDs
    - HLA
    - Time Management and Adapting Simulations from DIS
    - Hands-on training
    - F-18 simulator
- Targeted Outreach to Military Schools