

# Architecture of the Object Oriented ARC framework for C# over .NET

**T. Vamsi Kalyan & R.K. Joshi**

*Department of Computer Science and Engineering  
IIT Bombay*

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# Outline of the talk

- What is ARC
- ARC Kernel Services
- Architectural view of ARC framework
- ARC from the user's point of view
- Summary and current status of work

# Anonymous Remote Computing (ARC)

- ARC is a message passing paradigm to support writing parallel/distributed programs.
- ARC provides parallel/distributed programming constructs.
- Issues in ARC framework are
  - Selecting a processor.
  - Sending a task and waiting for the results.
  - Handling of node failures.

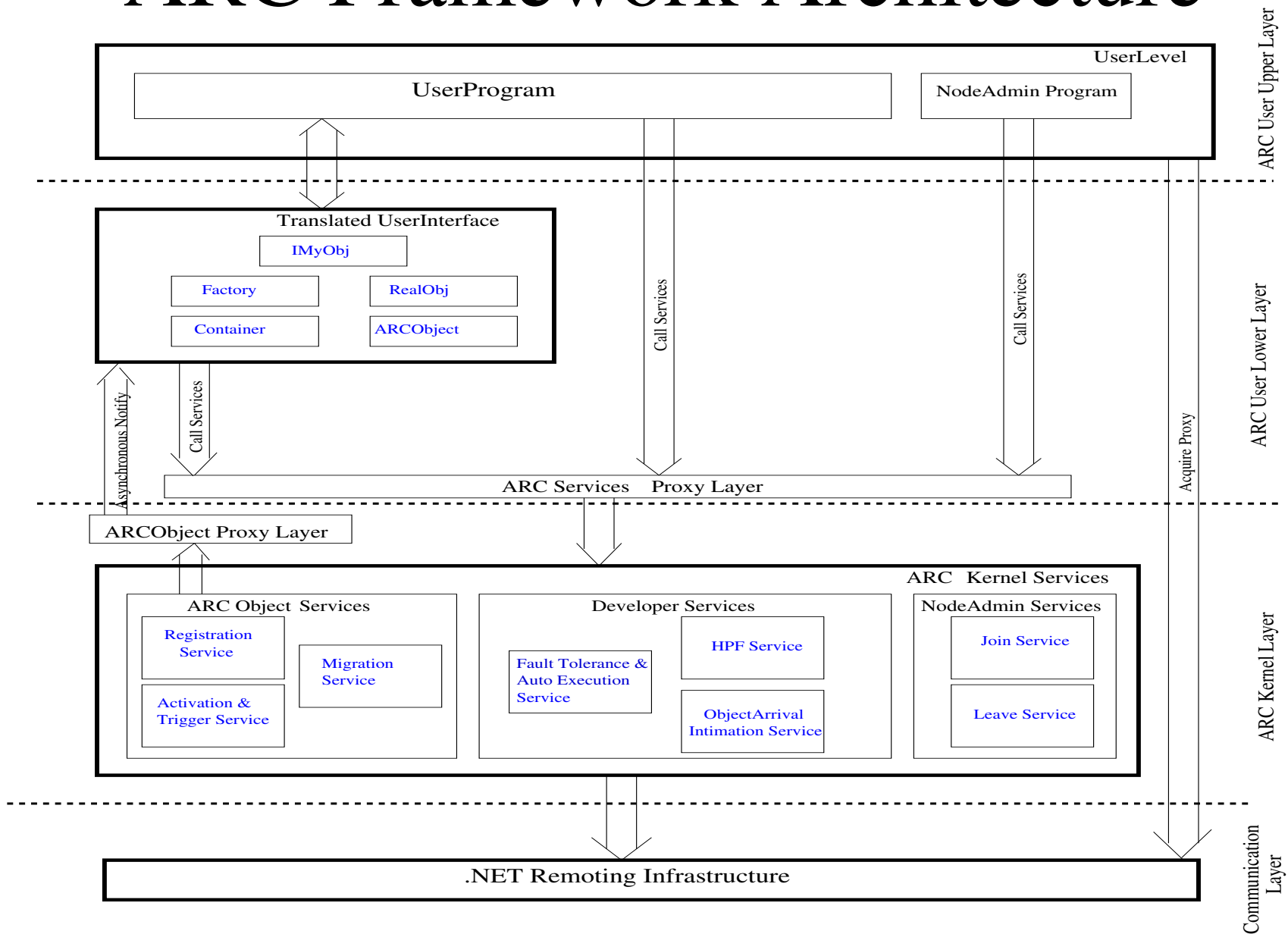
# What is ARC over C#/.NET

- Object-oriented, message passing framework to support development of distributed applications in presence of load, heterogeneity, failures and mobility.
- Integration of
  - Anonymity
  - Service orientation
  - Mobility and distribution of objects
- Scalable (dynamic join and dynamic leave) system in terms of participating nodes in a network.

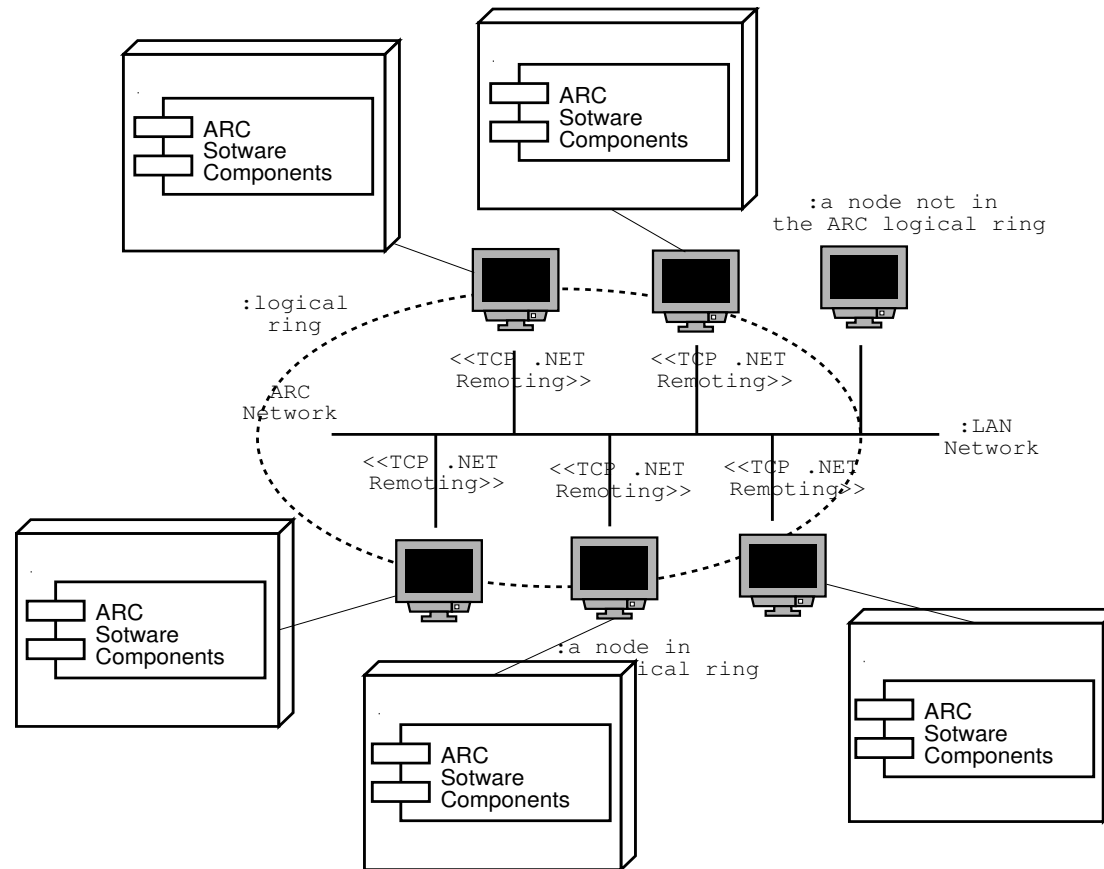
# ARC Kernel Level Services

- Registration Service
- Migration Service
- Synchronization
- Retraction Construct
- Connect Construct
- Multi-hopping
- HPF Service
- Fault Tolerance Service
- Auto Execution Service
- Failure Detection
- Object Arrival Intimation Service
- Activation and Deactivation Service
- Join Operation
- Leave Operation

# ARC Framework Architecture



# Deployment View of ARC Software over LAN

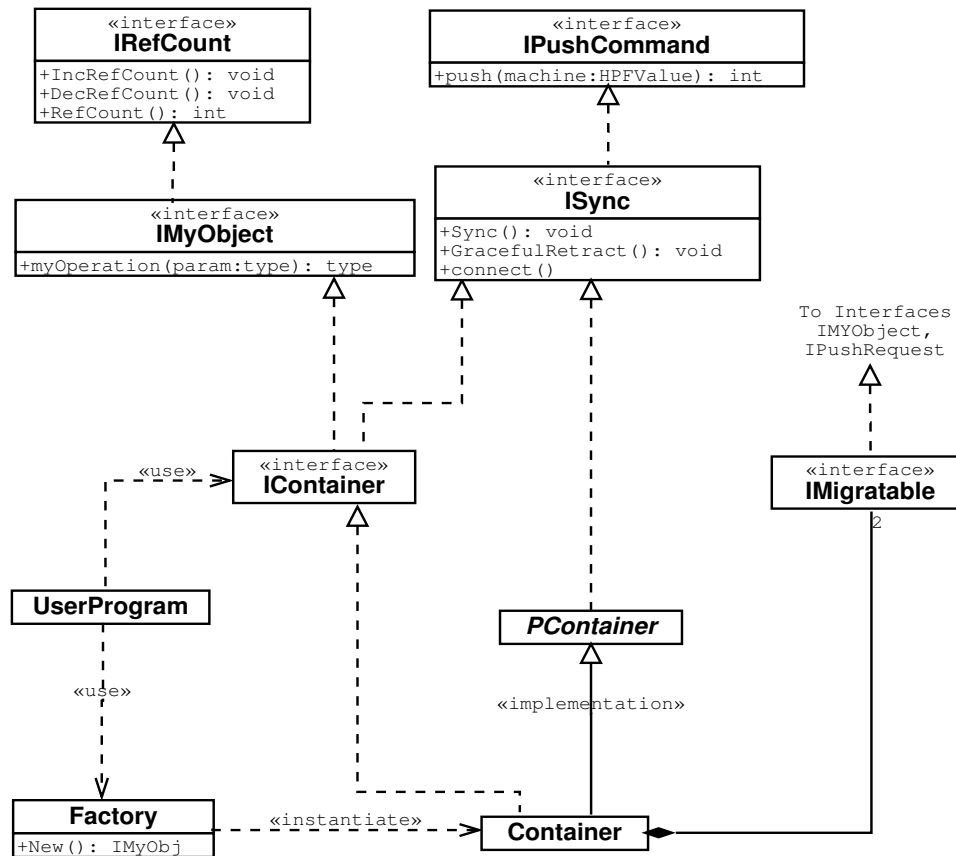


# User's Perspective

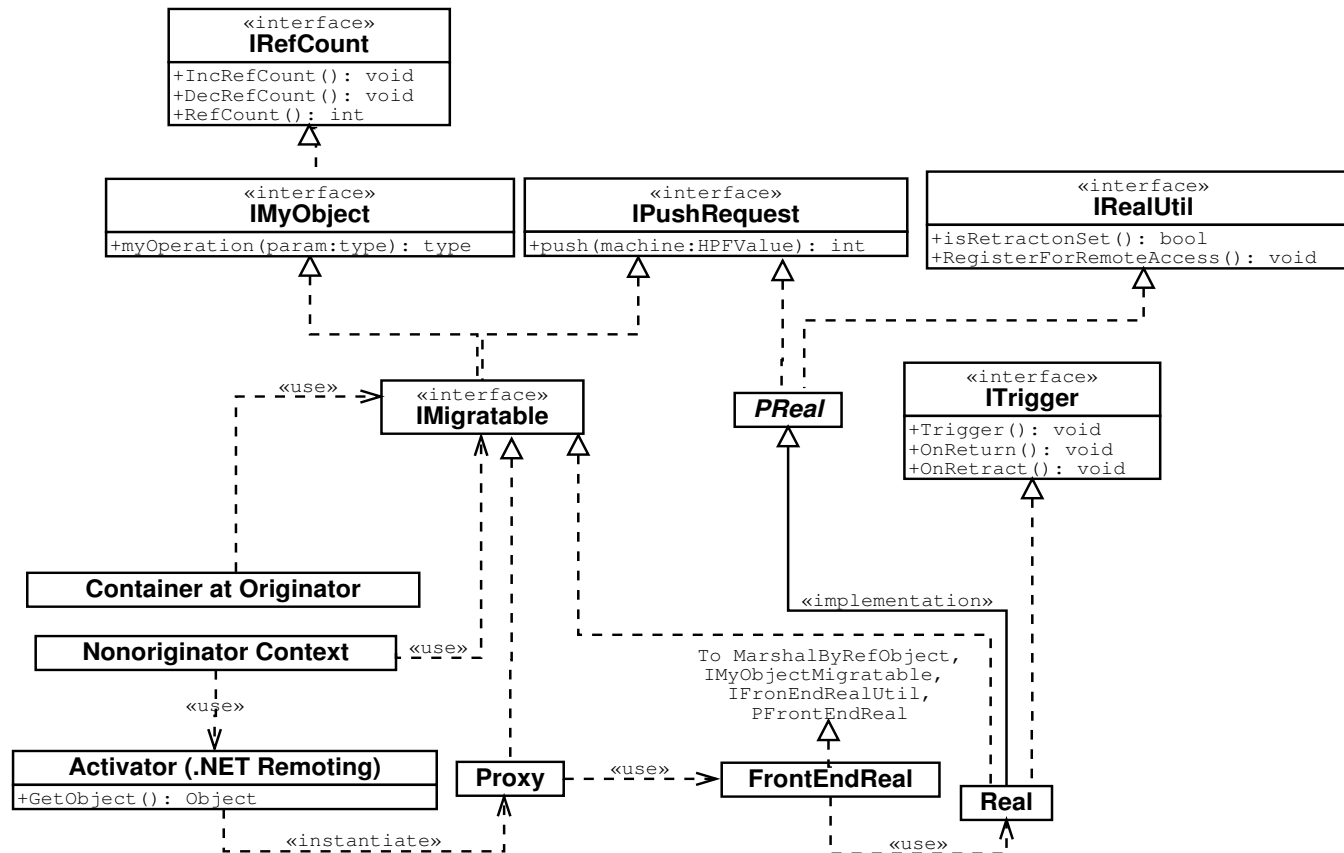
- A platform above .NET to support development of distributed applications.
- ARC Kernel level provides partial support for object migration and activating on remote nodes.
- User has to write the methods that are not only application specific but also interact with the framework.
- Some functionalities are provided to the user as partially implemented classes in ARC user lower level.



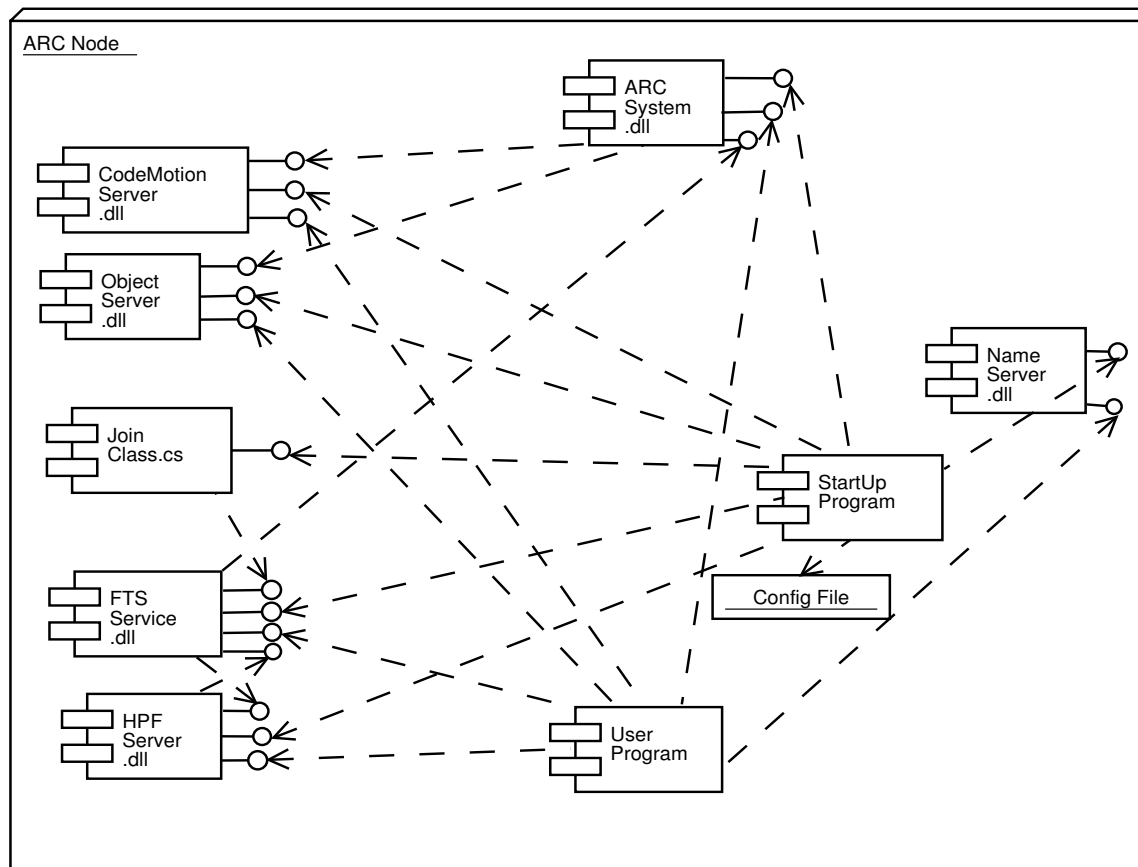
# Design of Container



# Design of Class Real



# Component View of ARC Software over LAN



# Components Categorized Based on Services

ARC Object Service Components	Developer Service Components	Node Administrator Service Components
ARCSystem	HPFServer	JoinServer
ObjectServer	FTSServer	Startup Program
Code Motion Server	Name Server	

# Summary

- ARC framework integrates
  - Anonymity
  - Mobility and distribution of objects
  - Service orientation at interface and interaction level
  - Object orientation at design and implementation level
  - OOAD process followed for development
- LAN and Internet versions of ARC software code
  - Tested using four Windows 2000 workstations.
- Main design goal was separation of system's concerns from the programmer's concerns while building service oriented and object-oriented ARC framework over C#/.NET.

# Current Status of the Research

- ARC over LAN has been extended to work over the Internet by keeping reuse and providing same abstraction to the user as main objectives.
  - ASP.NET, XML Web services, .NET, C#
- Security issues are not addressed in current work and needs to be addressed.
- Application framework and application that involve real world problems

Website:

<http://www.cse.iitb.ac.in/~rkj/arc...>

Thank You