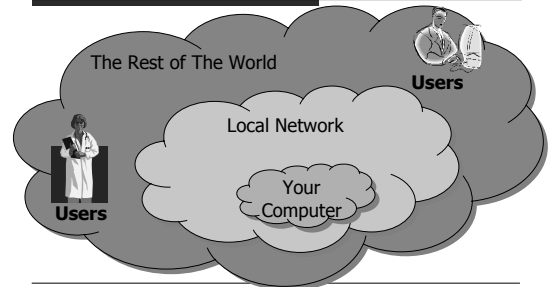


What Is .Net?

In A Fundamental Sense...

The Details Are Many And You Can Read About Those

It's A Big World



It's A Big World

- There is a lot of very inexpensive computing power
- There is a lot of very inexpensive communications bandwidth
- There are a lot of cool things connected to the Network
- There are lots of visions about what the whole thing can do

Tremendous Potential

- Major business applications:
 - Web interface
 - Back-end database
 - User interaction for advanced applications
- Business-to-business application of retail technology
- Interconnected business information systems
- Look at the Walmart example...

This Is REALLY Important

- Service provision from the Network is a major opportunity
- The productivity impact is tremendous
- The opportunity for new services is tremendous
- Computing without the network is not going to realize the potential
- It is programming within the Network, not point-to-point communications

So What Is The Problem?

Why, the software of course...

Major Problem Areas

- Software in different languages
- Data in different formats
- Databases with different interfaces
- Communications protocols that can't intercommunicate
- Security mechanisms that are inconvenient
- User interfaces that don't interoperate
- Software is too hard to write
- Software is far too fragile

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So What Is The Problem?

- Much of what we have built is inconsistent
- Actually, it is a real mess
- Suppose there were 50 different end-user voltage standards for power!
- There needs to be a complete and consistent infrastructure for Network applications
- That is what .Net is

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The "Endian" Problem

- An (old) example of data representation inconsistency



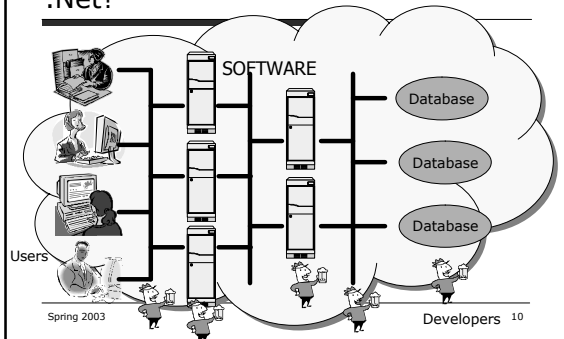
Which byte do the most significant bits go in?

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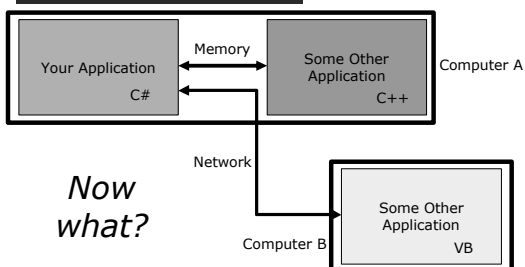
Why Do We Need Something Like .Net?



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Developers 10

How Do You Build Software Out Of Programs?



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Some Of The Problems...

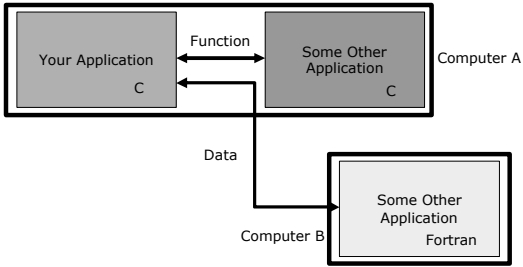
- How do you find the other program(s)?
- How do you invoke other programs?
- How do you pass data or share data with other programs?
- How do you manage the resources in a mutually beneficial way?
- How do you deal with

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In The Beginning...

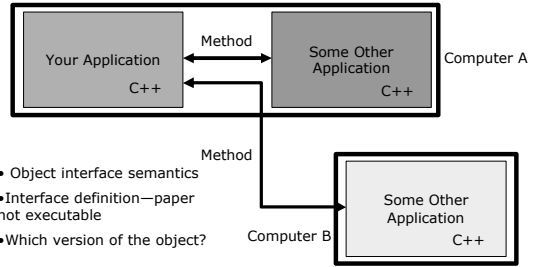


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Then There Were Objects...



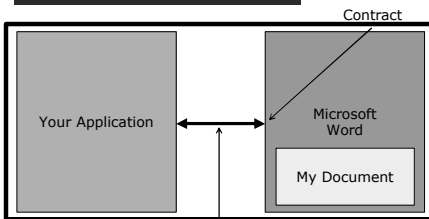
- Object interface semantics
- Interface definition—paper not executable
- Which version of the object?

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An Example



Access document as an object using a well-defined software interface with semantics "equivalent" to being inside your application

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Contracts

- What needs to be in a contract?
- How would a contract be defined?
- How would a program find out what a contract was?
- How would a program find out what version of the available services was used?

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Contracts

- How would one implement a contract mechanism in practice?
 - Function invocation, i.e., the calling convention
 - Parameter/data formats
 - Memory management (method call => stack frame)
 - Exception management
 - Threads, etc.
 - Security
- Is any of this going to work across languages?

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What Is .Net?

- Extensive execution-time features with serious functionality (.Net Framework):
 - Portability, version management
 - Memory management, lang. independence
 - Access protection, OS API
 - Comprehensive object interface exposed
- Enhanced Active Server Pages for providing Web page user interfaces (ASP.Net)

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What Is .Net?

- Standard server interface functions accessed using XML and HTTP (.Net Web Services)
- An application generator that facilitates the construction of high-quality application user interfaces (.Net Windows Forms)
- Database access/integration support via Active Data Objects (ADO.Net)

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Common Language Runtime

- All .Net languages:
 - Compile to MSIL
 - Use JIT compilers
 - Use common representations
- Common Language Runtime (CLR):
 - Consistent set of services for all languages
 - Comprehensive name management
 - Entirely new contract mechanism
- What is the role of MSIL in contracts?

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20