JAVA DAYS ´99



RMI over IIOP
RMI (over JRMP)

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Agenda



- J2EE
- RMI and CORBA
- RMI over IIOP Programming
- RMI (JRMP) features

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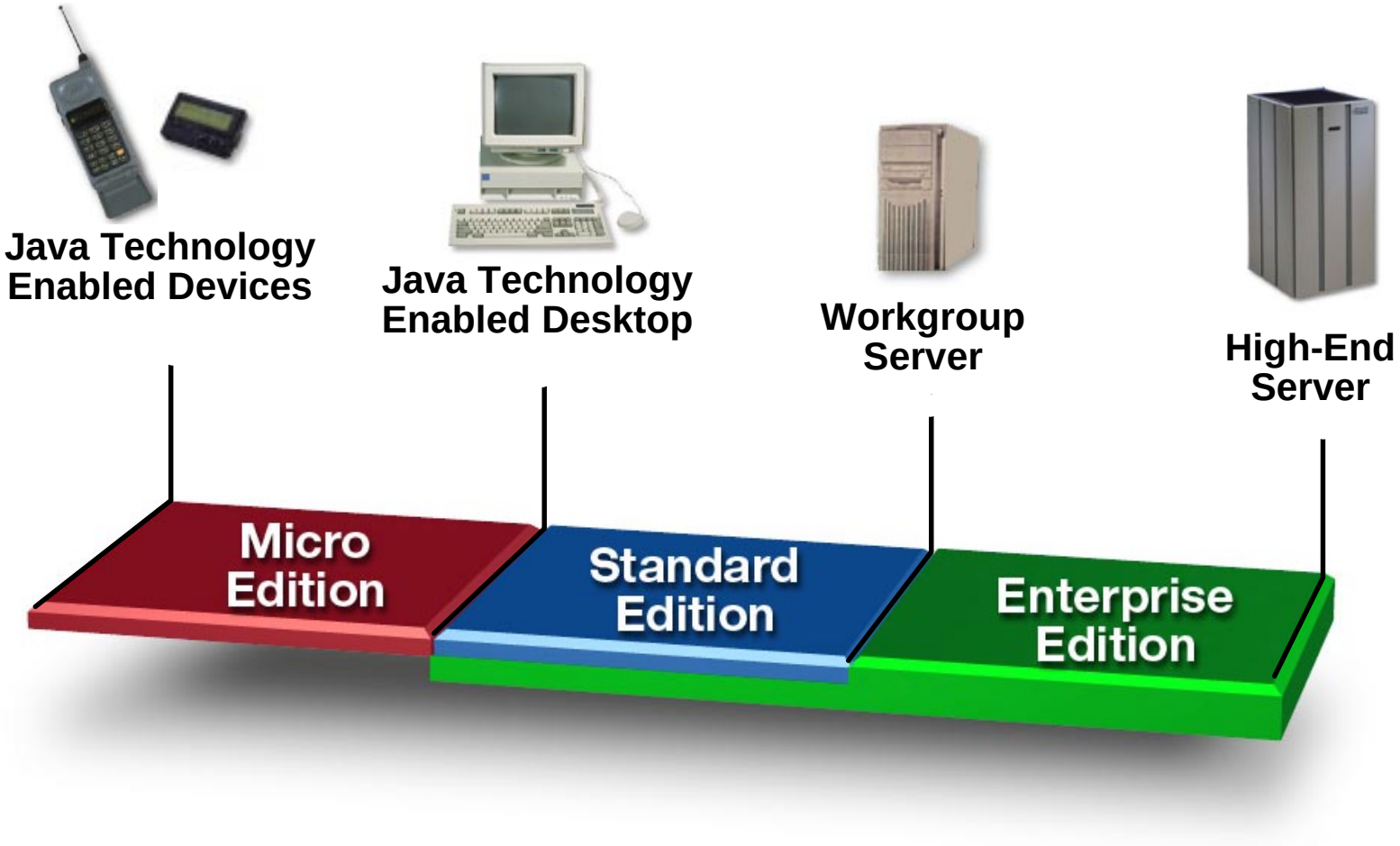


J2EE

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Java 2 Platform Devices



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Java Platform



Where Have We Been, Where Are We Going

Year 1

- JDK All Things to Everyone

Year 2

- JDK "All Things to the Enterprise"
- Early Development of Consumer Java
- Early Development of "Enterprise" APIs"

Year 3

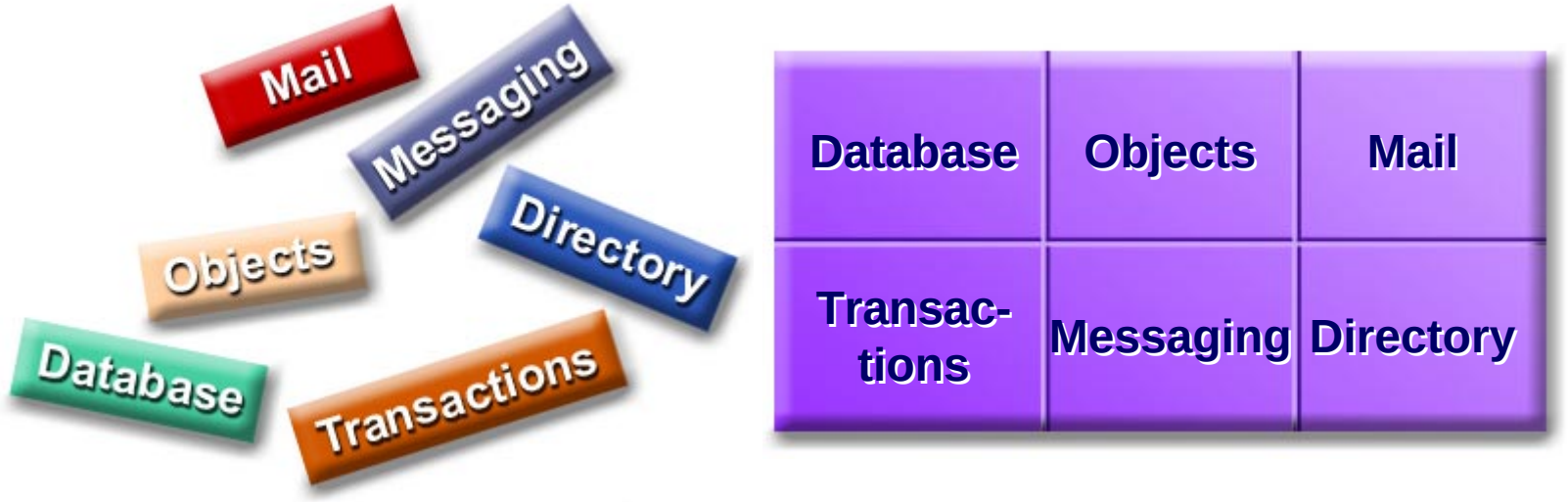
- Micro Edition
- Standard Edition
- Enterprise Edition



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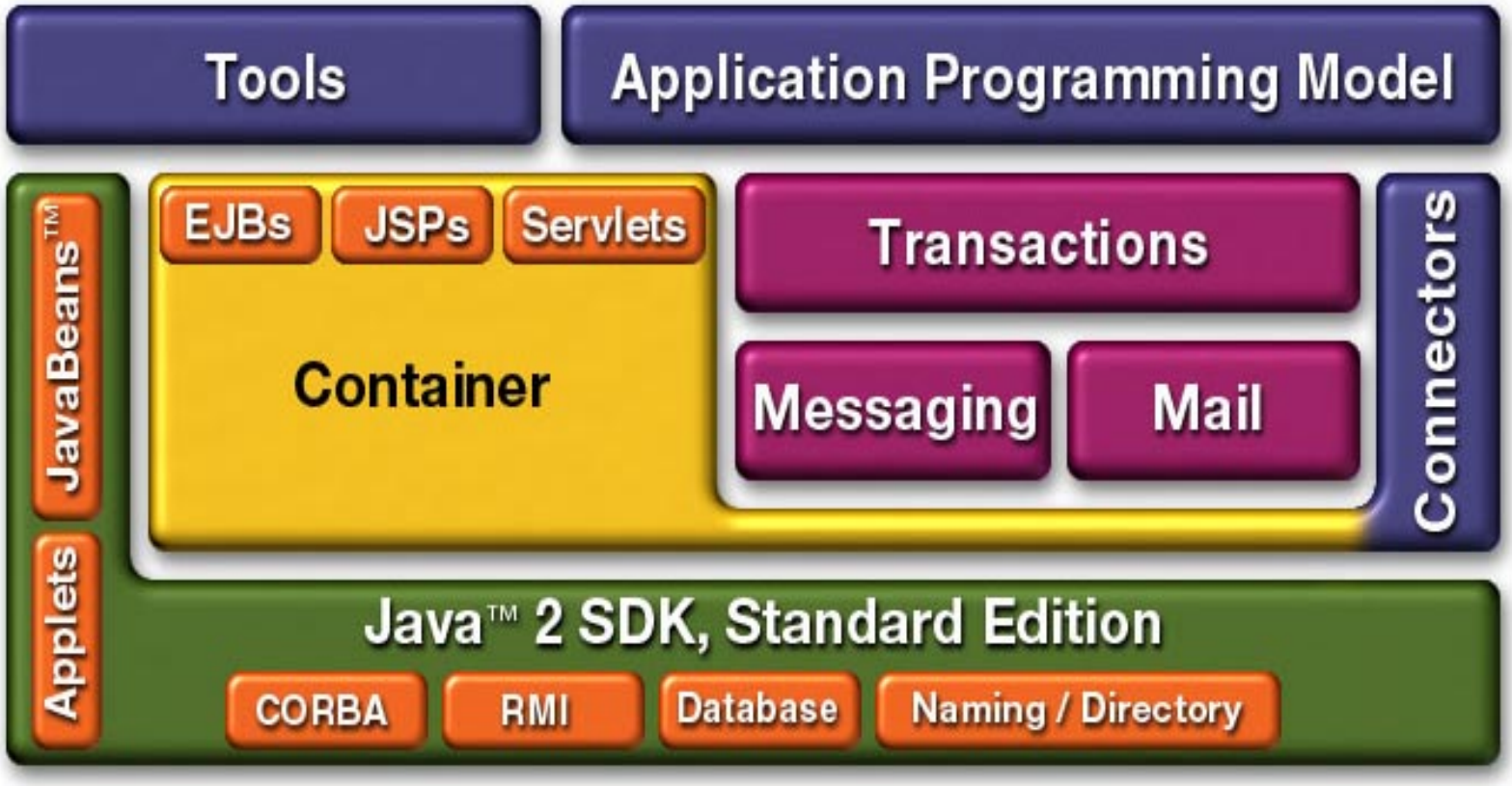
Java® 2 Enterprise Edition





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J2EE Architecture



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RMI and CORBA

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RMI



- Easy to use
  - No IDL or mapping to learn
  - All Java programming model
- Pervasive on Java
  - Part of JDK 1.1
  - Extended features in JDK 1.2
  - Underpinning of Enterprise JavaBeans

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CORBA



- Interoperable
  - With many platforms
  - With many languages
- Standard
- Industry supported
- Wide range of services defined

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RMI over IIOP



- Large subset of JDK 1.2 RMI API
  - True subset of RMI over JRMP
  - RMI ease of use
- Implements the OMG specs
  - CORBA objects-by-value extension
  - CORBA Java to IDL Mapping
  - Genuine interoperability

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RMI over IIOP Programming

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RMI-IIOP Programming



- New base class: PortableRemoteObject
  - Like UnicastRemoteObject
  - Supports both IIOP and JRMP
  - Tie-style skeletons

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RMI-IIOP Programming



- Need explicit "unexport" call
  - Can't rely on distributed garbage collection
- JNDI/CosNaming Replaces
  - RMI registry
- Narrow() Replaces
  - Casts of remote interfaces

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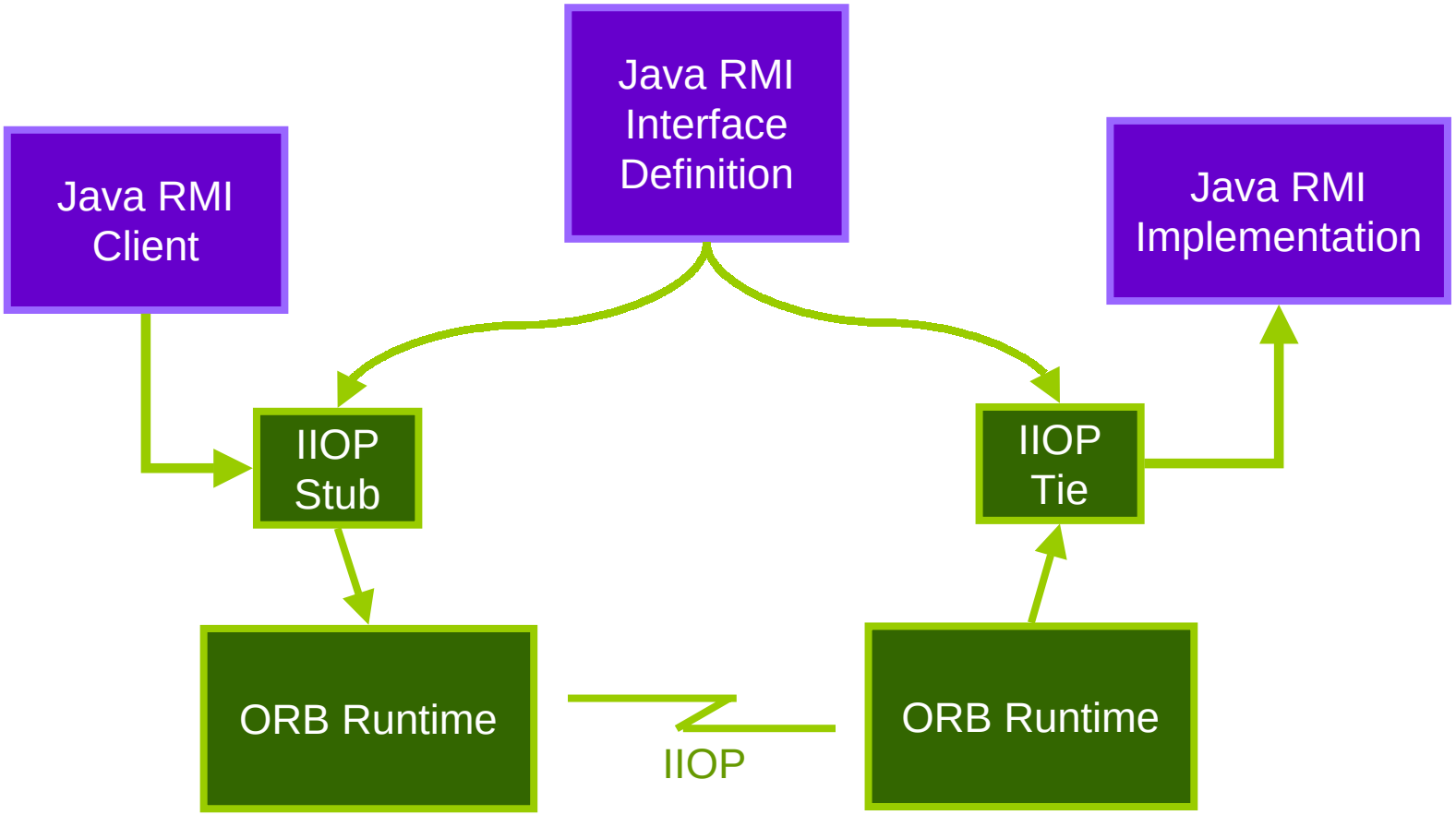
RMI-IIOP Components



- Runtime (including ORB)
- rmic
  - Generates Stubs and IDL
- IDL Compiler
- Samples
- Documentation

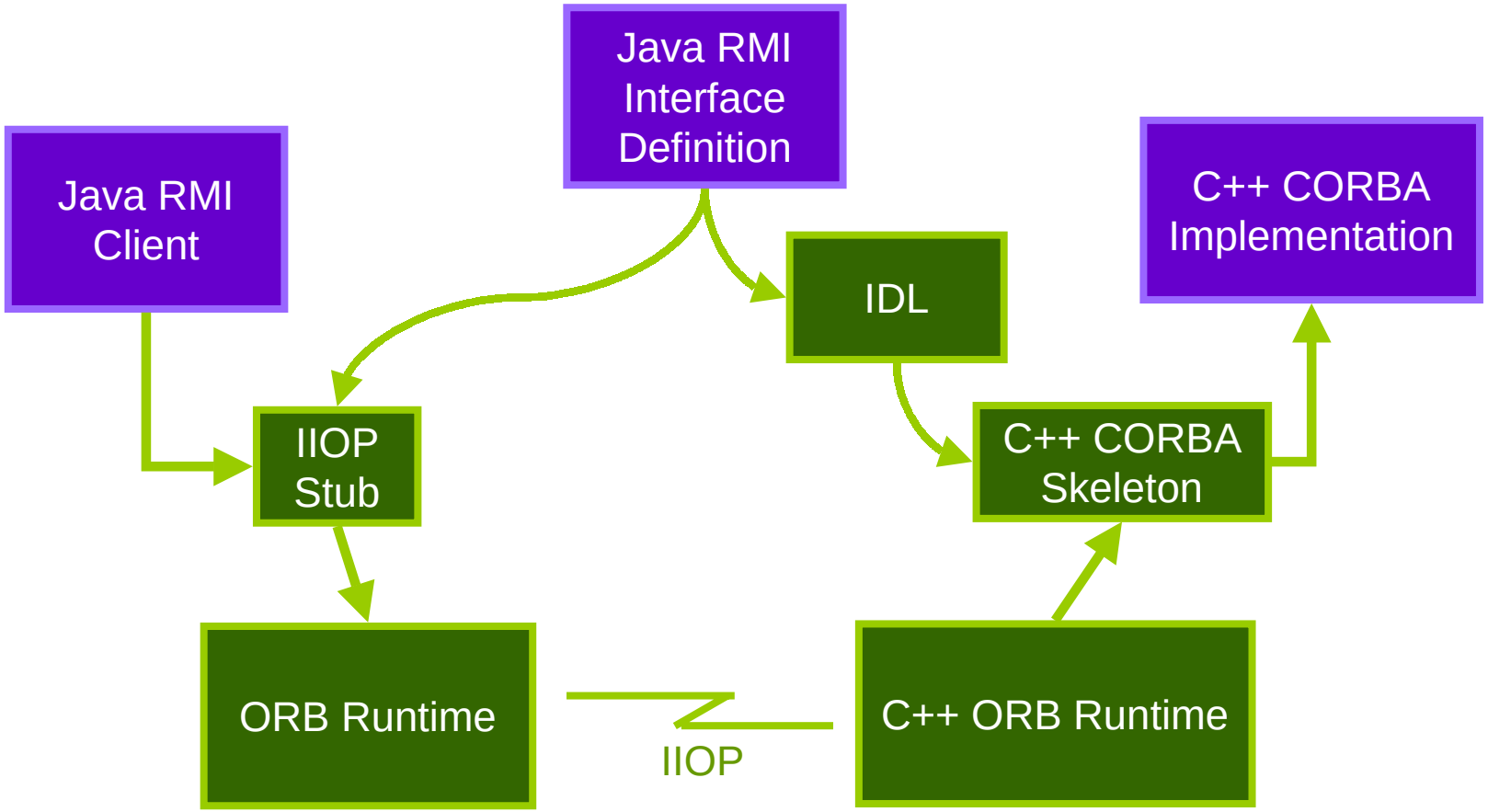
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RMI over IIOP (Java to Java)



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RMI over IIOP (Java to C++)



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ORB Runtime



- User APIs
  - PortableRemoteObject
  - server base class, narrow method
- Enhanced Java IDL ORB
  - Objects By Value support
  - Java to IDL Mapping extensions

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ORB Runtime



- Portability APIs
  - Utility functions for portable stubs and ties
  - Runtime functionality common across ORBs
  - Java serialization over IIOP

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rmic for Stubs



- -iiop generates tie and stubs

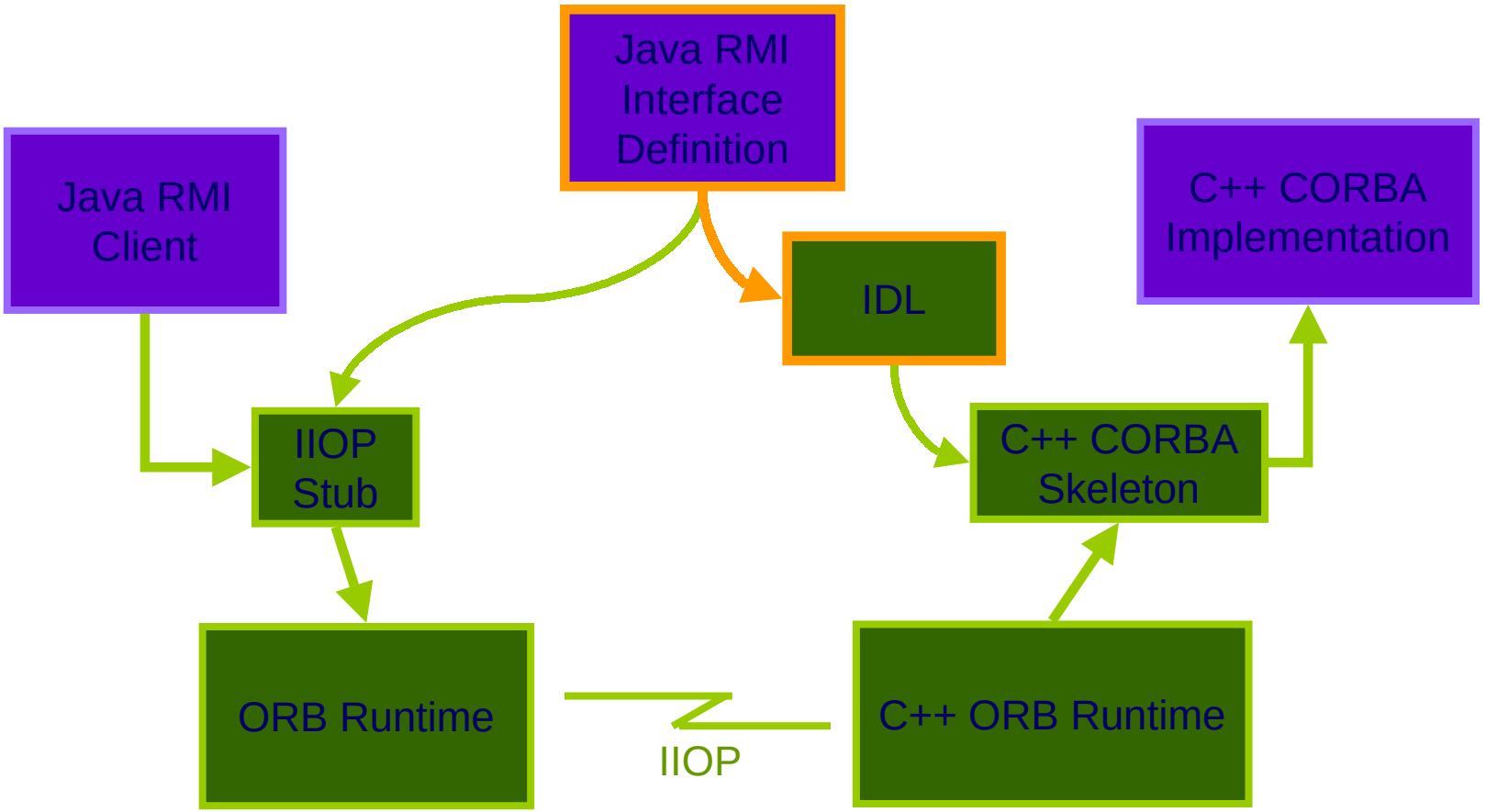
  Specify interface to get only a stub

- Can generate both IIOP and JRMP stubs
- RMI semantics supported
  - references to shared objects
  - exception handling
- Optimization for local calls

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IDL Generator



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rmic for IDL



- -idl option generates OMG IDL

  As if written by a well intentioned human

- Use IDL to produce bindings for other languages

  IDL compiler must support CORBA 2.3

- Java types passed by value must be reimplemented in other language

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IDL Compiler



- IDL Compiler
  - written in Java
  - supports CORBA 2.3 IDL (nearly!)
- Available as early access
  - Objects By Value Java bindings will change
- Can be used with RMI-IIOP to experiment with generated IDL

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Java IDL and RMI-IIOP



Java IDL

- IDL-to-Java mapping
- Write IDL interface definitions
- Use tools to map IDL to Java
- Write Java implementation code

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Development Status



- Co-developed by Sun and IBM
  - Standard Extension on both 1.1.6 and 1.2
  - 1.0 FCS June 10, 1999
  - 1.0.1 Coming Soon
- Part of J2SE v 1.3 Beta release
  - All RMI-IIOP functionality
  - IDL Compiler, 100% Java

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RMI (over JRMP)

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J2SE, v 1.2 Features



- Activation
- Custom socket factories
- DGC improvements

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J2SE, v 1.3 Features



- Serialization Enhancements
- Dynamic Proxy classes

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Resources



- http://java.sun.com/j2ee
- http:/java.sun.com/products/jdk/rmi
- OMG Java to IDL Mapping specification
  - ftp://ftp.omg.org/pub/docs/ptc/99-03-09.pdf
- OMG Objects By Value specification
  - ftp://ftp.omg.org/pub/docs/orbos/98-01-18.pdf

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