



JavaOneSM

Sun's Worldwide Java Developer Conference



**Java™ and
NetWare:
Issues and
Opportunities
for Java
Applications in
the NetWare
Environment**

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NetWare Opportunity



Novell.

- Installed Base:
 - Over 55 million PC client nodes
 - Over 3 million Servers
- Current Run Rate:
 - 63% of NOS servers
 - 51% of NOS and app servers



NetWare Opportunity



Novell.

- NetWare is used:
 - By businesses of all sizes
 - For resource sharing
 - For communications infrastructure
 - For database servers
 - To support office automation and PC personal productivity apps



NetWare Opportunity



Novell.

- NetWare has by far the largest installed base of intranet business customers
- Novell strongly supports Java™ and is providing infrastructure for client and server Java business applications



NetWare on Java



Novell.

- Novell will provide Java and JIT compilation on NetWare servers
 - First “OS-level” license covers clients if needed
 - GUI for NetWare
- Java will be a “user level” execution environment for server applications on NetWare



Java Value

Java's pervasiveness, combined with platform and processor neutrality, enables a new generation of distributed applications



- Not just for browsers and client apps
- Useful for deployment of server-side and distributed logic



NetWare Value

NetWare is a special purpose application and services platform:

- Optimized for network communication and resource sharing
- “Minimal” OS well suited for Java





NetWare Value (cont.)



NetWare is a special purpose application and services platform:

- Robust set of services including file, transport independent print, directory and management
- Adding strong intranet / internet capabilities including Web publishing, proxy, firewall, etc.
- NetWare is becoming fully transport independent

NetWare Uses of the Java Language



Novell.

- NetWare will use Java apps in a variety of ways:
 - User-level programming for NetWare servers
 - Client & server administration and management utilities
 - Novell Directory Services schema enhancements

NetWare Uses of the Java Language (cont.)



Novell.

- Dynamic HTML page generation
- Access to NetWare service without requiring NetWare client technology
 - Java NCP engine for legacy NetWare servers
- Flexible logic deployment between client and server



NetWare Value to Java Apps



Novell.

- NetWare services and infrastructure adds business oriented capabilities to the Java environment
- Exploit NetWare global naming, security, access control
 - Other services like resource sharing, communications gateways, etc.
- Class libraries for business applications
 - Most not NetWare specific
 - Anticipate some added to base system

NetWare Value to Java Apps (cont.)



Novell.

- Java component management
- Novell Directory Services as a component registry / trader
 - Logical naming, access control, configuration management, versioning, multiple service providers
- Infrastructure to realize Java's potential to minimize software distribution / installation / management / maintenance problems



NetWare Value to Java Apps (cont.)



Novell.

- Distributed application communication infrastructure
 - Integrated, secure, authenticated communication “pipe”
- RMI, CORBA access to NetWare services, infrastructure
- NetWare servers ideally suited to host Java
 - Ongoing NetWare OS enhancements driven by Java requirements

Flexible Component Deployment



Novell.

- Java based components which can run anywhere on the network
 - Location transparent to users
 - Location transparent to other components
 - Application structural benefits



Flexible Component Deployment (cont.)



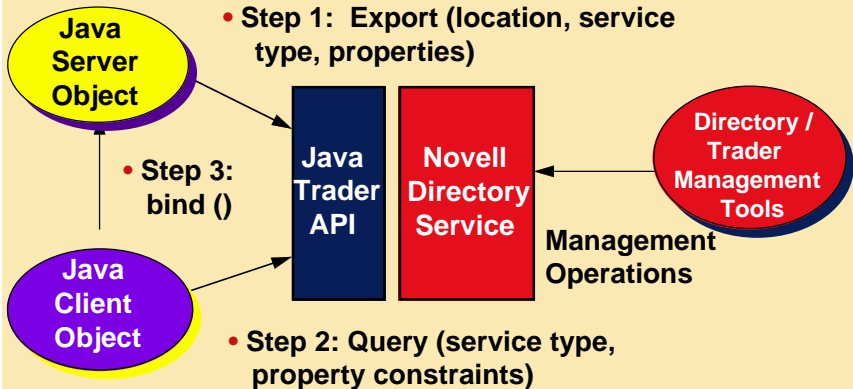
Enabled by:

- Identical Java environment everywhere
 - Including on NetWare servers
- Java network loading and location transparent invocation (e.g., CORBA, RMI)
- Location transparent management, directory, and trading services (e.g., NDS, X.500, etc.)

NDS-Based Java Trading Service



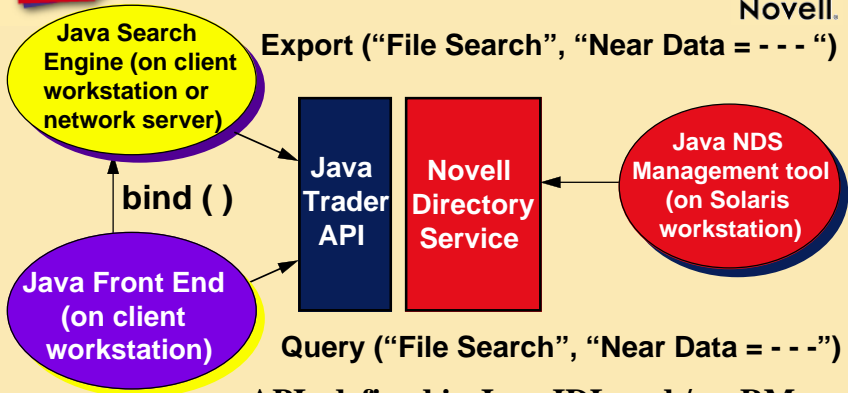
Novell.



Java File Search Application Using Trader



Novell.



- APIs defined in Java IDL and / or RM
- Communication via "Doors" ORB



Proposed Java Class Library Extensions



1. Generic Naming Classes
 - Common Object Service-based
 - Supported by NDS, LDAP, ODSI, X.500
2. Protocol independent enhancements to java.net
 - IPX / SPX
 - Preparatory for IPv6
3. Security



Future of Distributed Applications



Flexible Semantic Content

Computer to Computer Communication
Evolution:

“Retrieve the Data” (resource sharing) →

“Retrieve the Answer” (SQL)

Next evolutionary step:

“Optimally Place Logic” (Java-based)

Ability to optimally place logic will
revolutionize distributed applications

Future of Distributed Applications



Novell.

- “Service” Protocol Evolution:
 - Simple Verb (NCP, HTTP) →
 - Sophisticated Verb (SQL) →
 - Procedural (RPC) →
 - Object (IIOP)
- Next Evolutionary Step:
 - Object + Logic (IIOP + URL + Java apps)

Java helps enable dynamic placement of logic to distributed objects

How Flexible Logic Deployment Works



Browser Example:



1. User selects “hypertext link” which connects browser via URL to appropriate server
2. Using HTTP, browser requests page definition from server which includes references to Java applets
3. Browser requests and downloads Java applets and runs them

How Flexible Logic Deployment Works



Client SQL Example:



1. Client SQL application connects to SQL server specific database
2. Client “pushes” application low level SQL query logic to server
3. Client invokes object methods which transparently execute application logic on the server

Infrastructure for Distributed Applications



Novell.

Java Language +
Rich Transport +
Directory (NDS) +
Objects (ORB) +
Component Management =
Next Generation infrastructure
for Distributed Applications



NetWare / Java Time Frame



Novell.

- Now:
 - <http://java.novell.com>
- June:
 - Naming class library proposal
- July:
 - Naming class library prototype

NetWare / Java Time Frame (cont.)



Novell.

- **September:**
 - java.nlm beta
 - Additional generic and NetWare specific class libraries in beta
- **October:**
 - Full JDK
- **Mid '97**
 - NetWare release fully integrated with Java



NetWare and Java



Novell.

- NetWare represents a huge new opportunity for Java business applications
- Novell is committed to the success of the Java programming language