



Java Everywhere

Simon Ritter

Technology Evangelist

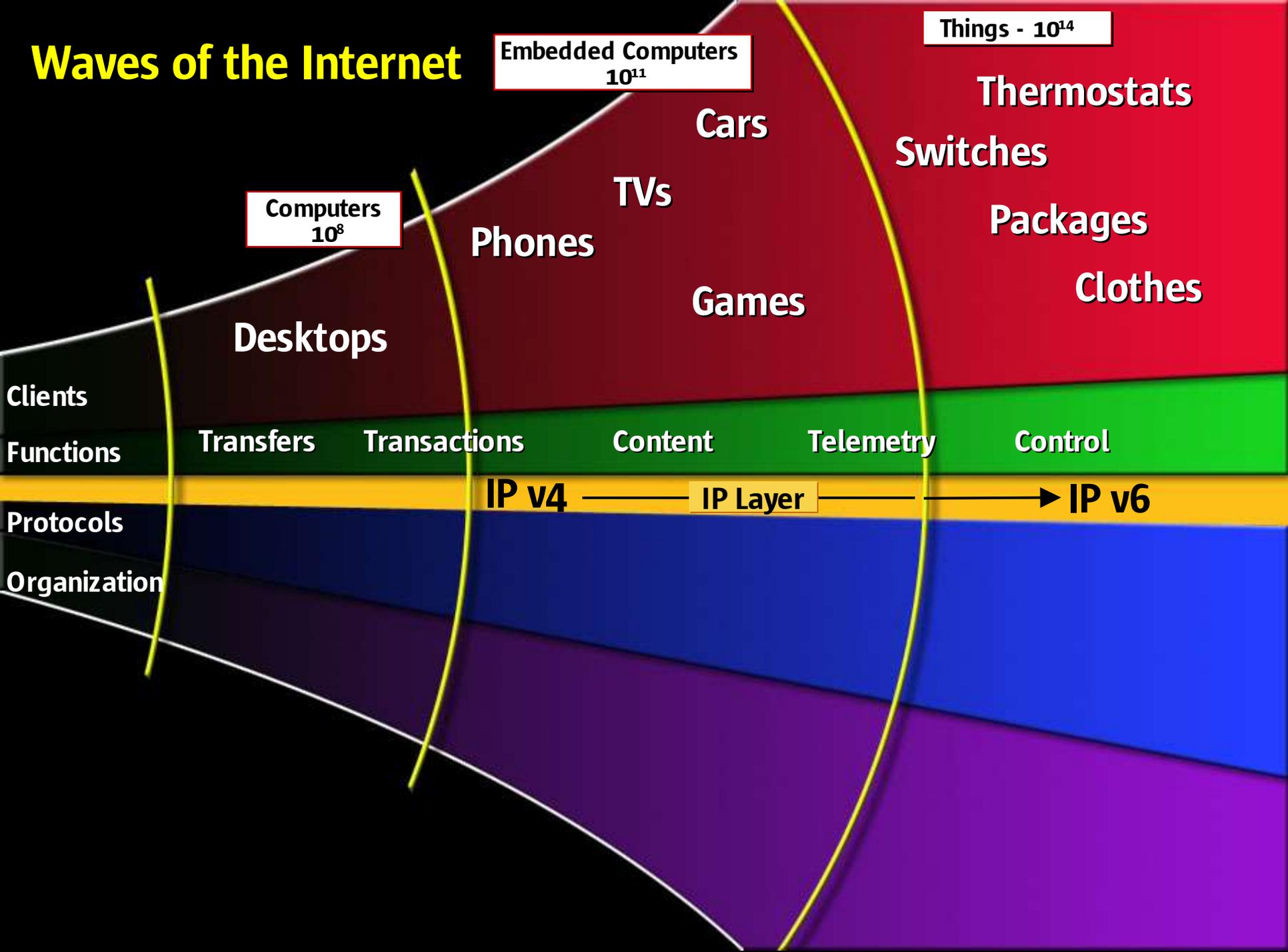
Sun Microsystems, Inc.



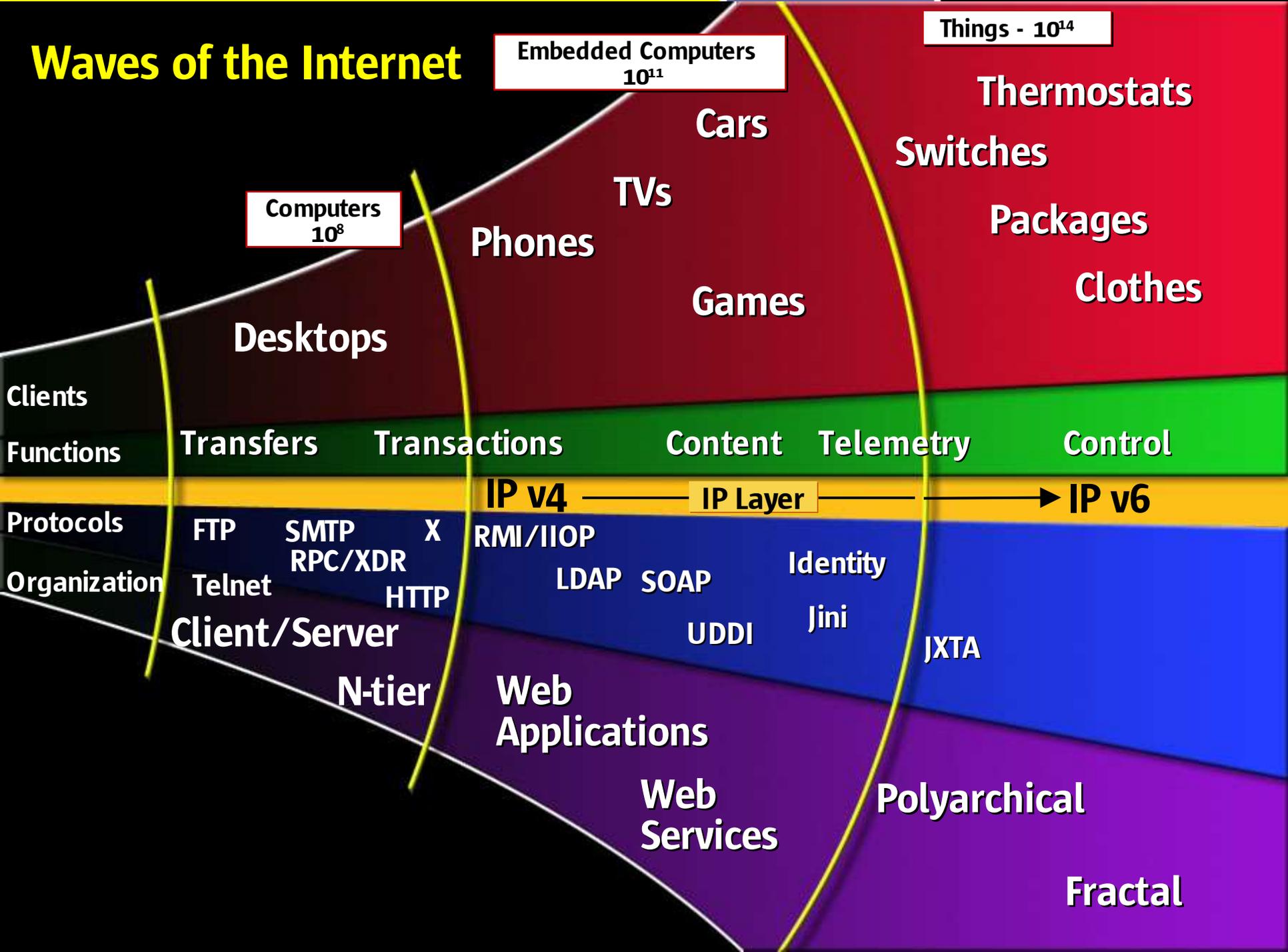
Agenda

- Data & Web Services
- The Sun Java Enterprise System
- Future Directions For Java
 - Ease of Development
- Summary

Waves of the Internet



Waves of the Internet



Embedded Computers
 10^{11}

Things - 10^{14}

Computers
 10^8

Thermostats

Switches

Packages

Clothes

Cars

TVs

Phones

Games

Desktops

Clients

Functions

Transfers

Transactions

Content

Telemetry

Control

Protocols

FTP

SMTP

X

RMI/IIOP

LDAP

SOAP

Identity

IP v4

IP Layer

IP v6

Organization

Telnet

RPC/XDR

HTTP

LDAP

SOAP

Jini

JXTA

Client/Server

N-tier

Web Applications

Web Services

Polyarchical

Fractal

Auto-ID/RFID: The New Barcode

- Radio Frequency Identity Tags
- Data can be changed
- No line of site required
- 96-bits is plenty of storage

Lots Of Possibilities...

- Supply chain management
- Parcel tracking
- Refrigerator/oven
- Washing machine
- Personalised advertising
- Use your imagination...

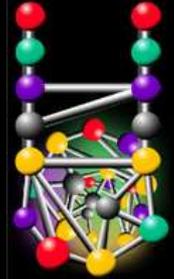
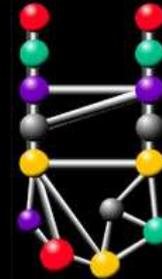
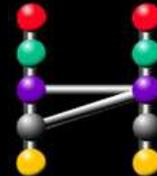
Three “Laws” of Computing

- Moore's Law
 - Computing power doubles every 18 months
- Gilder's Law
 - Network bandwidth capacity doubles every 12 months
- Metcalfe's Law (Net Effect)
 - Value of network increases exponentially as number of participants increases

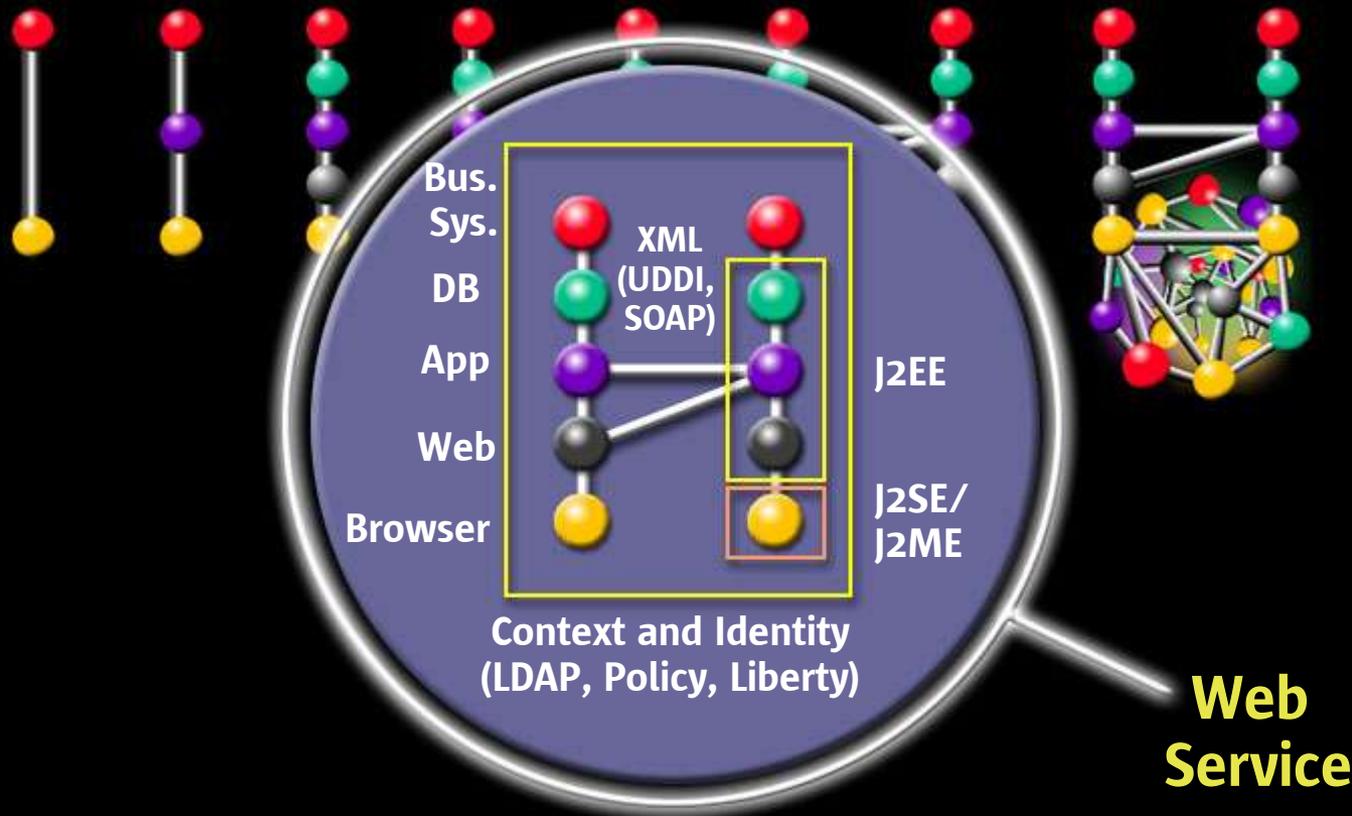
Platform Evolution

Catch Phrase	The Network Is the Computer	Objects	Legacy to the Web	The Computer Is the Network	Network of Embedded Things	Network of Things
Scale	100s	1,000s	1,000,000s	10,000,000s	100,000,000s	100,000,000s
When/Peak	1984/1987	1990/1993	1996/1999	2001/2003	1998/2004	2004/2007
Leaf Protocol(s)	X	X	+HTTP (+JVM)	+XML Portal	+RM	Unknown
Directory(s)	NS, NS+	+CDS	+LDAP(*)	+UDDI	+Jini	+?
Session	RPC, XDR	+CORBA	+CORBA, RM	+SOAP, XML	+RM/Jini	+?

Schematic



Design Patterns: Web Service



Web Services Adoption

- 1st phase
 - Concerted deployment internally within an organization
- 2nd phase
 - Selective deployment with outside business partners
- 3rd phase
 - Wider deployment with outside business partners

First Generation Web Services

- XML based
- Message-based
- Language independent
- Dynamically located
- Accessed over the internet
- Loosely coupled
- Using standard protocols

Web Services Inhibitors

- Basic web services designed for RPC
 - B2B is different
 - Reliability
 - Choreography
 - Security
- Performance
 - XML massively degrades network performance
 - ASN.1 being considered
- Politics!
 - Too many standards
 - Royalties?

Sun™ Java Enterprise System

- Software for the Enterprise
- \$100 per employee per year
- Genuine “Right To Use”



Sun™ Java Enterprise System Architecture

Creation And Assembly
Sun, Borland, WebGain, Rational,...

Services

Clients

HTML
XML
XHTML
← — — — →
WML
CHTML
SOAP



Heterogeneous
Devices

Browser, Desktop,
J2ME™ Device,...

Presentation
Servlets, JSP,
RMI
Sun,
Apache,
IBM,...

Business Logic
EJB, JMS
Sun,
BEA, IBM, ATG,
Oracle,...

Integration
JDBC, JCA,
CORBA
Sun, BEA,
IBM, Iona,...

Identity & Policy
Kerberos, LDAP, PKI
Sun, Novell, CA,...

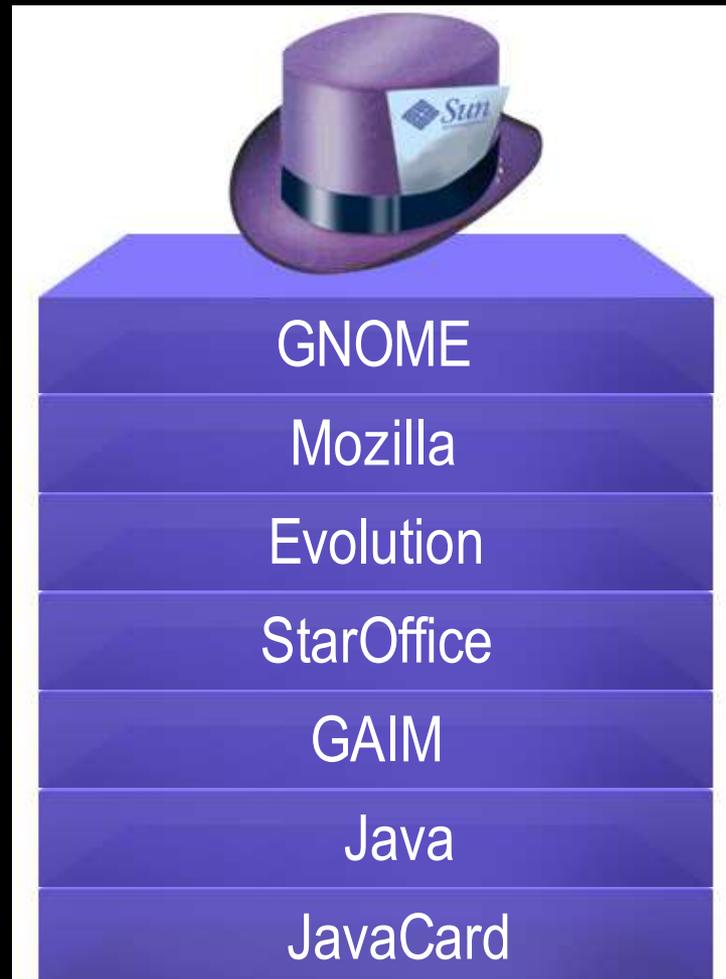
Service Platform
Solaris™, Linux, Windows,...

Project Liberty

- Liberty standard allows shared login
- Shipping NOW
- Java Card is a standard for smart cards
- NOW in mass deployments
- Java Card + Liberty = highest security standard for network identity



Java Desktop System



Java Desktop System

Java Stats

- Java in 100% of Fortune 500 companies
 - 78% of executives view Java as the choice for web services
- Java installed on 550 million desktops
- 150 Java enabled mobile phone models
- More than 3 million Java developers
- JRE is second most popular download on the internet
- Java is widely recognised consumer brand

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- More than 3 million Java developers
- JRE is second most popular download on the internet
- Java is widely recognised consumer brand
 - Most non-techies associate it with Microsoft!

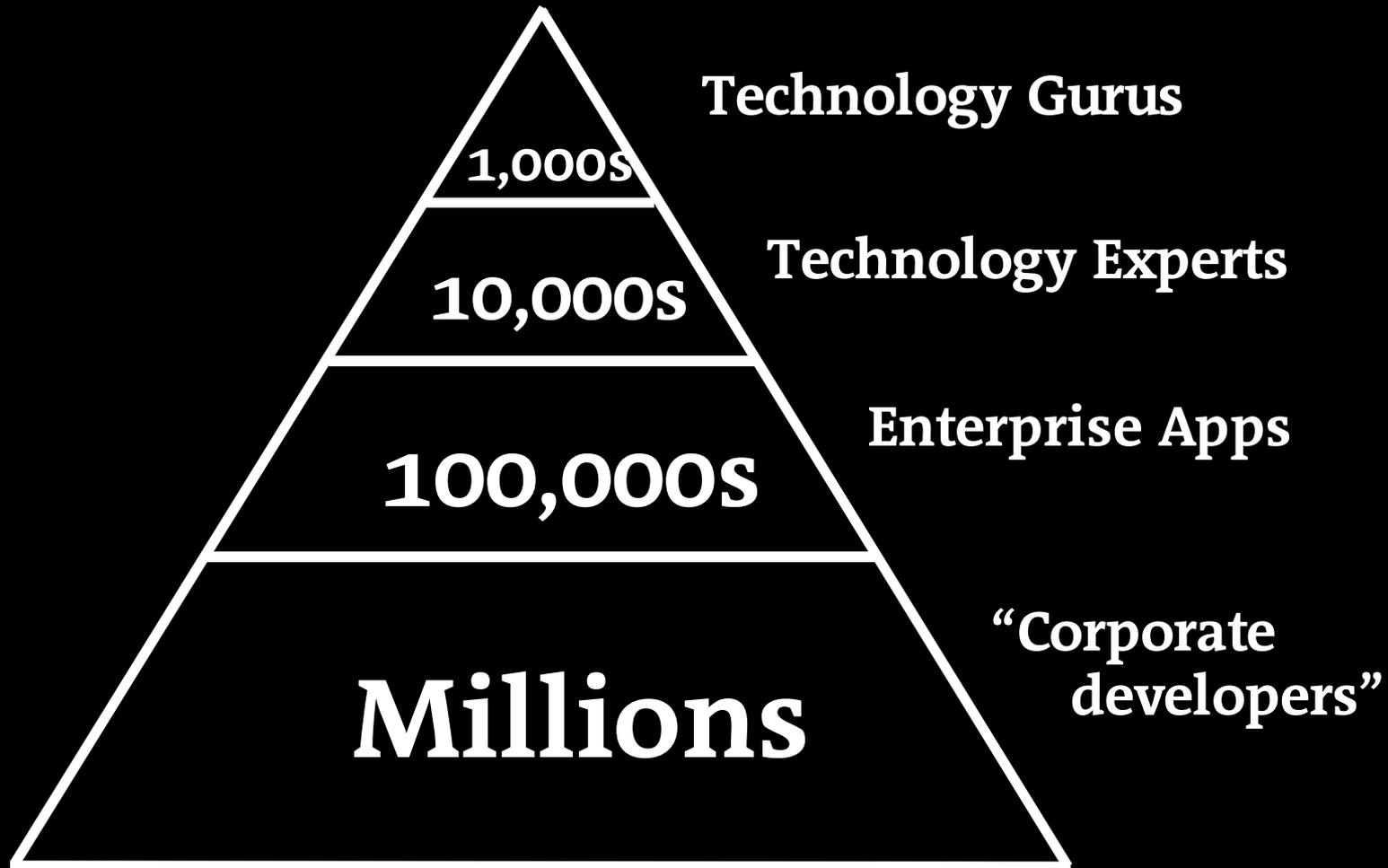
Java Community Process

- Executive committee
- Java Specification Request
 - Currently 232 Requests
- Expert Group
 - Interested companies/individuals
- Public Review
- Reference Implementation
- Compatability Test Kit
 - Sun/Apache scholarship fund

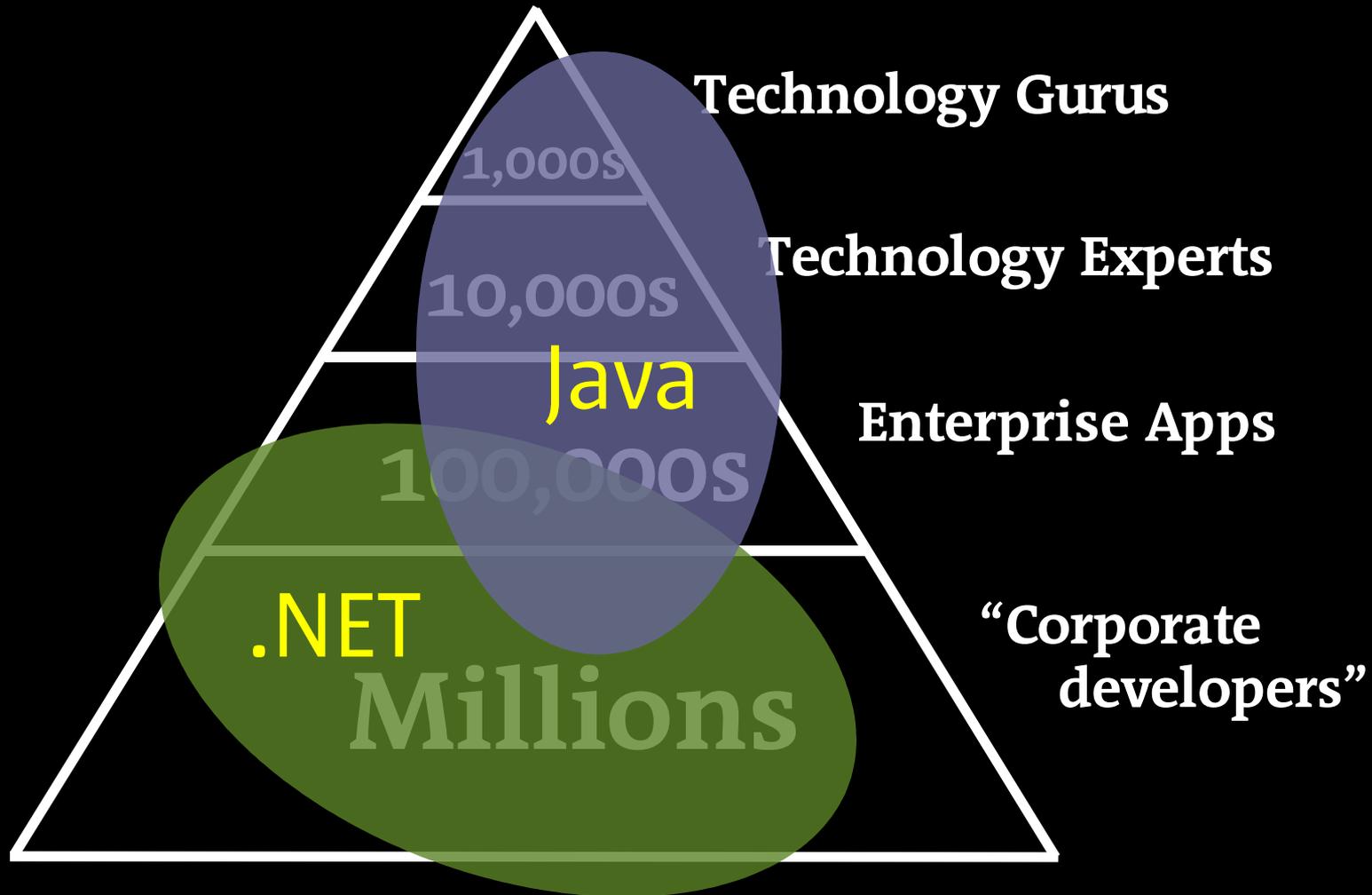
The Java Community: Strength in Numbers

- Java programmers:
 - 2.5 million, as of 2001 (source: Gartner)
 - Prediction of 4 million by end 2003 (source: IDC)
- Java in universities:
 - 78% teach Java, 50% require Java
 - (source: The Middleware Company)
- Java usage is expected to grow 29.4% in 2003 alone
 - (source: IDC Worldwide Developer Model)

Developers



Developers



JDK Themes

- 1.0 – First Release
- 1.1 – New event model
- 1.2 – Performance, New APIs
- 1.3 – Performance, Hot Spot
- 1.4 – Performance, Reliability, Availability
- 1.5 – Performance, Ease of development

JDK 1.5, “Tiger”

- Next major J2SE release
 - Biggest impact on language since JDK1.0
- Themes & features still under design
- Will go through the JCP

ALL FEATURES ARE TENTATIVE

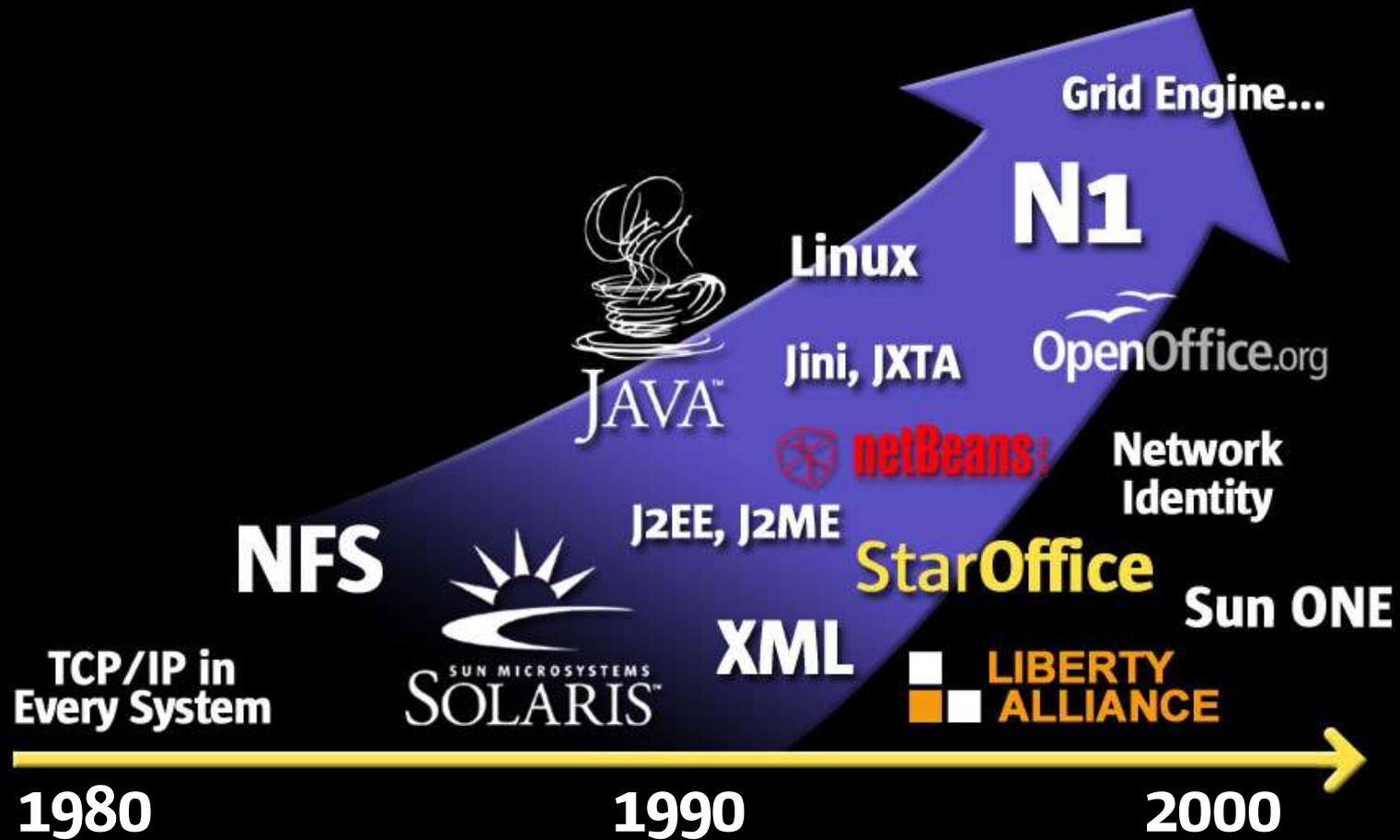
JDK 1.5 Themes

- Compatibility, Compatibility, Compatibility!
- Quality
- Monitoring and Manageability
- Performance and Scalability
- Client for XML and Web Services
- Ease of Development

New Java Language Features JDK 1.5, “Tiger”

- Generics
- Auto-boxing
- Enumerations
- Meta-data
- Enhanced for loop
- Varargs
- Static import

Sun as a Disruptive Innovator



Java Everywhere

- Freedom of choice
 - Write once, run anywhere
- Open Standard
 - JCP
- Constantly evolving
 - New features to ease development
- Still the best programming language



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