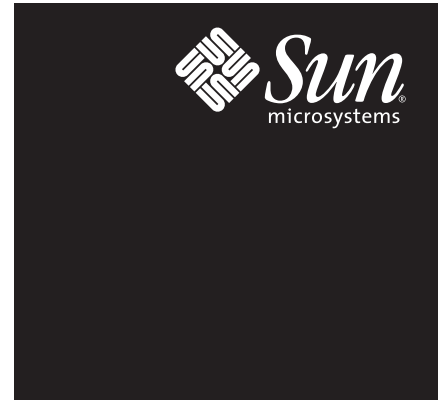


# Sun in Telecom



Reducing Cost and Complexity While Improving Time to Market

*Sun's Four Key Areas of Focus*

- Mobility Services
- Network Infrastructure
- OSS/BSS
- Service Delivery

We call it the Telecom Service Delivery Framework. It enables the "Personal Network," Sun's vision for how we are moving from a private device that operates over a public network to a "personal network" comprised of multiple devices, each aware of your unique preferences, profile, context and availability.

That is, the network follows you around allowing access to any data, from any device at any time.

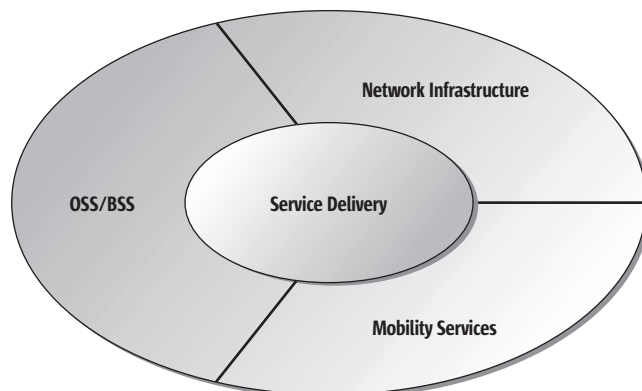
**Vision and Industry Focus: Sun Enables the Personal Network**

Sun is investing in four strategic areas to deliver solutions that will help carriers and Network Equipment Providers (NEPs) stay competitive: OSS/BSS, Network Infrastructure, Mobility Services and Service Delivery.

The Personal Network is the experience a carrier delivers through the power of their network by providing customers with their personal content and services in a timely manner, in multiple formats, accessible by multiple devices, centrally stored, and over any network at any time.

**What are the Industry Challenges (What Keeps Them "Awake at Night")?**

- Top carrier issues:
  - Reducing cost and complexity, e.g., make it easier to bill for services.
  - Quickly develop and deploy new services, i.e., fast time to market, beat competition.
  - Improve cost and efficiency of call centers, e.g., integrate VoIP and use thin clients like Sun Ray.
- Top NEP issues:
  - Enabling the above for their customers (the carrier).
  - Reducing their own Capital Expenditures (CAPEX) and Operations Expenditures (OPEX), much more cost-driven than 4 years ago.
  - Minimize integration and supply chain costs.



Sun's four key areas of focus: mobility services, network infrastructure, OSS/BSS, and service delivery.

- Leverage product development investments.
- Focus on delivering value-add above hardware and commercial software stack.
- Keeping up with rapid change in technology while balancing need for long-term product stability and support.
- Used to be technology driven, now very marketing driven. NEPs recognize they cannot save their way to top line revenue growth.
- Trends we're seeing in the Enterprise:
  - Outsourcing IT.
  - Technology refresh underway.
  - Significant focus on cost reduction and productivity improvements (e.g., VoIP or data failover systems).
- *There were 4.5 million controlled Vodafone Live! customers* at the end of December '03. All Live! Customers can only use a Java phone. (Vodafone annual report, December '03)
- *Nextel*, one of the first J2ME licensees, is now defining specific vertical business markets. They are already successful in construction and real estate markets. Highest Average Revenue per User (ARPU) among US carriers (~\$71/user versus ~\$49/user for Verizon). Apps are delivered to Java-enabled handsets that run on secure Sun servers in the back-end.
- *SMART*, a carrier in the Philippines, has deployed a Java application that links your credit card to your cell phone, i.e., whenever a credit purchase is made an SMS is sent to the your mobile phone. *This app has reduced credit fraud by 90%.*
- Cool example of M2M: An ISV called *8D* has developed a solar-powered Java-based automated parking meter management system that replaces multiple coin-operated parking meters with a single programmable wireless payment terminal. City officials can lower their cost of maintenance and improve collection efficiency—design their own specific Java app, quickly change parking fees at specific locations etc. The stations communicate wirelessly to PDAs and to back-end Sun Linux servers.
  - Deployed in Montreal today: <http://sun.systemnews.com/articles/75/1/feature/12907>
- The top 10 NEPs all use Sun solutions; they represent >90% of market revenue (Sun internal estimate).
- IDC expects growth in network equipment sales to service providers to grow from \$28B in 2003 to \$43B in 2007.
- *HUGE* network buildout occurring in Asia Pacific:
  - China is spending \$100B in network infrastructure over the next 5 years.
  - China Mobile is THE largest GSM operator in the world—now has >200M subscribers from 60M in 2001.
  - 1 in 4 mobile connections will be in the China/India region in 2004 (Ovum).
- Top issues/trends for NEPs:
  - Moving to commercial-off-the-shelf (COTS) products to reduce development costs—i.e., away from proprietary systems which cost more to develop/maintain.
  - Adopting industry standards for next-gen architectures, e.g., SAF, OSDL (Linux), AdvancedTCA as defined by PICMG consortium.
  - Lowering integration and supply chain costs. Sun helps with NEP Lifecycle Services, allows NEP to focus on their value-add while Sun handles integration, testing, and delivery to the customer.
- *Nortel's* Enterprise Continuity solution allows enterprises to design fully redundant back-up systems, provides automatic failover over long distances in the event of a system failure—real-time “mirroring” of data and applications. Built on Sun and Solaris. Successful deployment with the *Chicago Tribune*. See 3/16/04 press release: <http://www.sun.com/smi/Press/sunflash/2004-03/sunflash.20040316.1.html>

### Mobility Services

- It's about delivering mobile services to the handset.
- 300M Java-enabled devices in the market today (J2ME), deployed at 93 carriers WW.
- There is no single “killer app”; it depends on the target audience and varies widely, e.g., gaming for teenagers, lookup stats for real estate brokers, email for corporate users.
- Types of mobility services: m-entertainment, m-commerce, machine to machine (M2M), WiFi, messaging, location-based services, RFID.
- *Vodafone Live!* Planning 160 Java-based applications this year. Chose J2ME as the mobile operating system platform for all WW deployments—over 225M subscribers. See 12/03 announcement: <http://www.sun.com/smi/Press/sunflash/2003-12/sunflash.20031210.3.html>
  - Java.com added Vodafone Live! German games catalog on April 2004, see: <http://www.sun.com/smi/Press/sunflash/2004-04/sunflash.20040420.3.html>.

### Network Infrastructure—the Network

#### Equipment Providers

- This is about the core components of the network, the gear that transports voice, data and video to the end user, provides switching capabilities (how to route a call). Example components include media gateways, radio network controllers, base station controllers and softswitches.

- *Lucent Enhanced Communication Services*— a real-time communications system that improves employee productivity. Leverages the Sun Java ES portal and directory software, servers and client services. iForce solution announced at ITU: <http://www.sun.com/smi/Press/sunflash/2003-10/sunflash.20031014.6.html>
- *Siemens Next-gen IP solution called SURPASS Business Connection* delivers IP-based communications such as VoIP, multimedia communications, multiparty collaboration. Deployed at Cablevision, largest cable VoIP deployment: <http://www.icn.siemens.com/icn/news/2003/03051301.html>
  - Selected by SBC for their PremierSERV hosted IP communication service: <http://www.icn.siemens.com/icn/news/2004/04021001.html>
  - This solution is based on the Netra 240 and Netra 1280 servers.
- *NEP Lifecycle Services* opens up opportunities to expand business with NEPs to include engineering design/lab services, certification services, parts inventory/traceability, re-manufacturing and replacement services. <http://sun.systemnews.com/articles/73/4/news/12625?highlight=lifecycle+services>
- Move from network infrastructure-centric to customer-centric operations.
- Get away from the integration nightmare, when upgrading with new components.
- Converge/consolidate billing systems to reduce costs.
- Enable cross and up-selling of service offerings to customers.
- Sun's strategy is to help carriers reduce the cost and complexity of their OSS/BSS environment through:
  - Billing consolidation, a verticalization of Sun's "server consolidation" practice to billing. We are teaming with CSG, leveraging their Kenan FX billing solution.
  - OSS Through Java Initiative (OSS-J) adoption.
- Billing consolidation addresses three areas supporting better customer management and reduced cost and complexity in billing:
  - Consolidation of multiple billing systems into one (cost and churn reduction)
  - Pre/post paid convergence (up-selling)
  - Billing and order management consolidation (cost reduction)
- OSS-J is the implementation with Java of the Next Generation OSS (NGOSS) concepts and architecture developed by the TeleManagement Forum (TMF). It is the first and most comprehensive technology specific implementation of NGOSS endorsed by the TMF.
- Sun is a board member of the TMF, and the founder and leader of the OSS-J initiative. *We are leading the way for the industry!*
- Members of OSS-J include Nokia, Nortel, Motorola, NEC, MBT, BEA, IBM, Metasolv... in total over 20 actively contributing members.
- *More than 50% of carriers' spend on OSS/BSS is on customization!* NGOSS concepts and principles are primarily aimed at reducing

integration costs for OSS/BSS, and fostering a customer-centric approach to network operations.

- BT, Vodafone and Deutsche Telekom/T-Systems have said that OSS/J is the way to go and that there is no alternative today.
- Vodafone Germany hopes to save at least 20% through use of OSS/J.
- See OSS/J org website: <http://www.ossj.org/>

### Service Delivery

- It's the piece that connects the back-end databases to the devices.
- Allows carriers to deliver new revenue-generating services to subscribers without having to re-create a new infrastructure.
- New services = higher ARPU.
- Sun provides Java APIs on all sides of SDP to allow the integration to occur smoothly— OSS/J for OSS/BSS, J2ME for mobility services, Java for Intelligent Networks (JAIN) for network infrastructure.
- Network Identity makes it possible to manage large number of users across multiple applications (assigning names, passwords, privileges, etc.).
- Win at *Bell Mobility*, largest mobile operator in Canada, deployed Sun's Java System Content Delivery Server to enable delivery of data services to their customers; uses J2ME on the handset, CDS in the middle running on Sun servers in the backend.

### Voice Over Internet Protocol (VoIP)

- 2004 is the year VoIP takes off... it's happening now!
- Carriers expected to spend \$4.8B on next generation voice equipment by 2007, up from \$1.2B in 2003 (IDC).
- IDC estimates a 62% CAGR for VoIP gear from 2003–2007, the fastest growth in any network equipment category.

- There are 20M IP PBX lines installed WW in 2004, estimated to grow to 51M in 2008 (IDC).
- 4% of worldwide corporate phone lines use VoIP today — expected to grow to 44% in 2008 (Radicatti).
- Universities, financial institutions and hospitals are leading adopters of VoIP.
- Main drivers for adoption: lower communications costs, increase productivity (improved mobile workforce), desire for single communications architecture.
- Main challenges: reliability and security, ROI, LAN capacity.
- North America, Europe, Asia Pacific represent 41%/40%/16% share of corporate IP telephony market (Radicatti).
- Top players in Enterprise VoIP: Avaya, Cisco, Nortel, Siemens, Alcatel (Radicatti).
- Nortel, Lucent and Siemens VoIP solutions are built on Sun today (see Siemens' VoIP wins above).
- Nortel selected by Verizon for nationwide VoIP network 1/7/04:  
[http://www.nortelnetworks.com/corporate/news/topnews/2004a/01\\_07\\_04\\_verizon\\_voip.html](http://www.nortelnetworks.com/corporate/news/topnews/2004a/01_07_04_verizon_voip.html)
- *Tata Teleservices* (India) 8/2/04 — a private telecom provider, has signed with Sun to deploy Sun Fire™ 15K enterprise class high-end servers in support of its mission critical applications for billing, CRM, ERP, order management and data warehousing.  
<http://sun.systemnews.com/articles/78/1/news/13470>
- *Sasktel* (Canada) 7/27/04 — Java ES win for messaging, Sasktel has 4,300 employees and 450,000 subscribers, new offer targets SME with “eMessaging” service, reduced deployment time by 12 months, estimate a 700% ROI over 3 years:  
<http://sun.systemnews.com/articles/78/1/news/13493>
- *New Zealand Telecom* 7/19/04 — multimillion 5-year deal for backend servers and software, deploying the new E25K server:  
<http://sun.systemnews.com/articles/77/3/news/13448>
- *Quios* (USA) 7/16/04 — a leading mobile services company providing high quality, cross-carrier SMS services to businesses worldwide. The company's network extends to over 420 wireless carriers in Europe, Asia Pacific, and the U.S. Using Sun Content Delivery System and Java ES.  
<http://sun.systemnews.com/articles/77/2/SunJavaSystem/13412?highlight=quios>
- *Orange* (Caraiibe) 12/12/03 — largest telecommunications provider in the Caribbean islands of Guadeloupe and Martinique and also in French Guyana on the South American mainland. Migrated 4 terabytes of data from HP to Sun StorEdge 9980 and 9970 systems.
- *Marconi* (UK) 2/27/04 — a global telecommunications equipment, services and solutions company. Sun provided Netra servers, training and support for key components of their next-generation IP Telephony (VoIP) solution.
- *InMarsat* (UK) 4/15/04 — the world's first global mobile satellite communications operator, supports links for phone, fax and data communications at up to 64 kbit/s to more than 250,000 ship, vehicle, aircraft and portable terminals. Chose Sun's Java ES as the business support platform for its broadband mobile satellite communications network:  
<http://uk.sun.com/company/press-release/2004/2004-03-24.html>
- *Chunghwa Telecom* (Taiwan) 3/11/04 — deploying government advocated “Digital Taiwan Project” for broadband Internet access, data transmission and mobile audio/visual services. In production with Sun Fire 4800, volume system; Sun Fire V210, 200, 240, Sun Netra 20, and Sun StorEdge storage equipment; Sun StorEdge 6120 and Sun StorEdge 3310.
- *Viking Telecom* (Sweden) 8/13/2003 — entered new profitable market for SMS over wireline. Viking Telecom now develops its media gateways on Sun Fire™ 280R, Netra 20 and V210 servers.

#### Recent Wins in Telecom

- *Polska Telefonía Cyfrowa* (PTC) 7/31/04 — the largest mobile network in Poland, with 7 million subscribers and almost 37% share of the total Polish market. Java ES win for messaging, directory and web server. Clustered Sun Fire 280R and V100 servers running the Solaris 8 OS; Sun StorEdge arrays. Sun consultants worked with the PTC team to design and implement a next-generation Enterprise Messaging Infrastructure with two-way SMS based on Sun Java System components and Java technology.

#### Other Useful Stats

- Wireless is back — new U.S. subscribers grew 9.7% between 2001 — 2003 to almost 18M (CTIA 2004).
- 1.9 billion mobile connections by 2008 (Ovum).
- Top 10 mobile operators account for >50% of mobile subscribers (1.4B subs in 2004).

- Worldwide broadband lines grew to 100.8M during the last half of 2003, an increase of 62% over 2002. Share of broadband lines by region is APAC at 44%, Americas at 32% and EMEA at 24% (Point Topic, 3/23/04).
- Top 5 broadband countries are USA, Japan, China, South Korea and Canada. China leads in terms of number of broadband lines added 9.7M lines in 2003, a 70% increase over the prior year (Point Topic, 3/23/04).
- Worldwide base for broadband technology is expected to reach 325 million subscribers by 2008, up from about 100 million at the end of last year, according to new research from the Yankee Group.
- More China growth stats:
  - China is the #1 mobile country worldwide — 282M subscribers (as of February 2004).
  - 1.2m mobile subscribers sign up in China *per week* (Vision Gain).
- Mobile market:
  - 1.430 billion mobile subscribers in 2004 (Ovum).
  - 1.878 billion mobile subscribers by 2007 (Ovum).
  - 520 million mobile phones sold in 2003, 20% increase over 2002. Predict 580 million units in 2004 (Gartner).
- Java statistics:
  - 300 Java handset models available from 32 manufacturers.
  - 93 carrier deployments
  - 350 million Java handset install base as of June 30, 2004 (Ovum).
  - 600 million Java Cards deployed.
  - 1.5 billion Java-enabled devices by the end of 2007 (Ovum).
  - J2ME market penetration by 2007/2008 is expected to reach 50% of all 2.5G phones and 75% of 3G phones (Ovum).

#### For More Information

- <http://www.sun.com/telecom>

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