Accelerating the growth and profitability of next-generation services

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Introduction

Most telecommunications carriers see huge potential in converging voice, data and IP technologies into packet-based, multi-service "next-generation" networks (NGNs). Benefits can include:

- Faster introduction of new, innovative services
- Reduced costs
- Better responsiveness to customer demands and market opportunities
- Improved customer recruitment and retention
- Greater competitive differentiation

Yet despite the rich promise of NGNs, many service providers find the transformation to be costly and time-consuming as they struggle with isolated, proprietary infrastructures that are ill suited to a world demanding instantaneous communications and constant connectivity. The expense of developing, integrating and managing new services on proprietary systems can drain the resources of both network service and equipment providers as they try to work around and within traditional voice, data and IP silos.

For years, carriers and technology leaders like IBM have worked together to establish industry standards that will streamline the deployment of NGNs and the wealth of cost-efficient services they make possible. These standards are now accepted and in place. One of the first results is a family of carrier-grade, ready-to-deploy offerings from IBM that can serve as the foundation for providers to reduce time to market and simplify deployment of commercial, off-the-shelf (COTS) solutions. Known as the IBM @server® Integrated Platform for Telecommunications, this offering can also protect the value of proprietary legacy systems by enabling network and enterprise architectures to converge.

Increasing revenues, reducing costs and overcoming complexities

The telecommunications industry is driven to send into obscurity high costs, development and deployment delays, and technology constraints associated with their legacy network infrastructures. Today, eliminating these obstacles need not be slow or expensive and proprietary technologies needn't be abandoned. Carriers can transform themselves into agile, on demand providers by adopting a strategy that specifies:

Relying on an open standards-based infrastructure that allows for fast, easy, end-to-end connectivity among diverse applications, systems, processes, business partners, customer devices and beyond

Consolidating voice, data, IP and enterprise architectures into a single, dynamic, high-availability framework that helps to reduce costs and redirect resources away from managing disparate systems to increasing revenues and customer loyalty

Capitalizing on COTS solutions that accelerate responses to marketplace demands – at costs far lower than proprietary solutions

These strategy elements aren't unique to the telecommunications industry. For decades, companies in all types of businesses, including telecommunications, have used open standards to free themselves from highly complex IT integration and networking issues within their network and IT departments. Now, digital technologies permeate and surround telecommunications networks with IT, the stage is set for open IT standards to bring about the unprecedented integration of processes and services.

Open Source Development Labs (OSDL)

IBM is an active member of OSDL, a global, non-profit consortium of network and IT industry leaders that serves as the central body for accelerating the use of Linux through sponsorship of projects such as the one that led to the creation of Carrier Grade Linux.

IBM: IT for NGNs

IBM has long been involved in helping the telecommunications industry resolve complex infrastructure and networking issues. The company has made major investments in telecommunications-specific R&D, and has been an active participant on standards-setting boards within the industry. In fact, as an active member of the Open Standards Development Laboratory (OSDL), IBM has played a direct role in helping the industry extend flexibility, cost-efficiency and many other benefits of common technology standards to the service delivery environment.

IBM also helped spearhead the development of Carrier Grade Linux® to extend to carriers the stability, flexibility and many other advantages of the fastest-growing operating system in the world. In addition, IBM has developed a broad range of products and services that reflect the new role of IT in telecommunications networks. Examples include SPDE (Service Provider Delivery Environment) – a set of solutions designed to help service providers reduce operational expenses, enhance revenues, improve profits – and, more recently, the IBM @server Integrated Platform for Telecommunications.
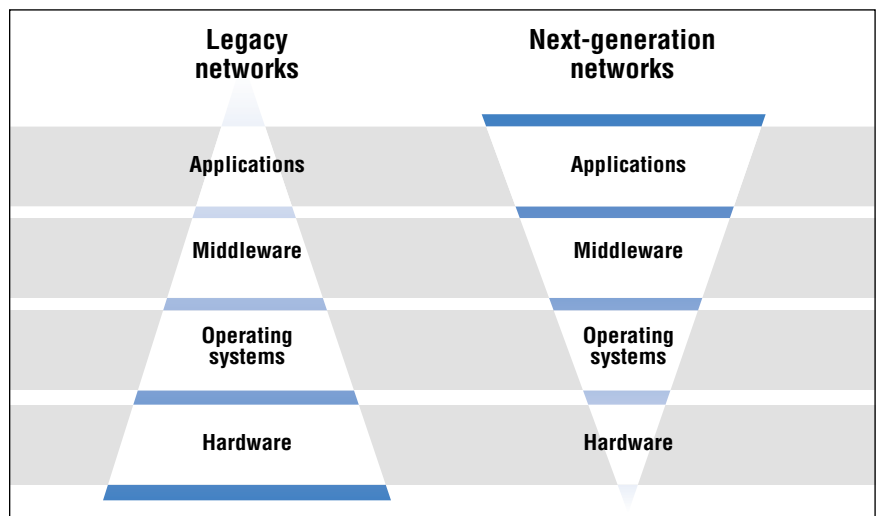
Legacy networks can be transformed into next-generation networks that require far less attention to managing disparate hardware and operating systems, enabling the focus to shift to the applications and middleware that add direct value to services – and higher profits to operating results.

The IBM @server **Integrated Platform for Telecommunications**

Telecommunications companies looking for faster, more economical ways to deliver value-added services can now base their efforts on the IBM @server Integrated Platform for Telecommunications. Configurations represent a comprehensive, commercial off-the-shelf (COTS) platform incorporating a carrier-grade, pre-integrated and pre-tested framework that includes:

- Best-in-class IBM hardware
- Carrier Grade Linux
- IBM software and high-availability middleware
- IBM support services
- Applications from a worldwide network of IBM Business Partners

"We are very impressed by the IBM Integrated Platform for Telecommunications. It delivers the reliability and a complete set of powerful tools required to build carrier-class infrastructures."

– Jean-Pierre Dumolard, CEO, CIRPACK

The IBM @server Integrated Platform for Telecommunications opens the way for service providers to grow their profits from COTS NGN solutions without abandoning their legacy systems. With the IBM @server Integrated Platform for Telecommunications, providers can quickly and economically converge disparate voice, data, IP and enterprise technologies solutions on a single, open platform. And because the platform adheres to Carrier Grade Open Framework (CGOF) standards, users can gain from the many COTS advances those standards will trigger.

CGOF-compliant:

The IBM @server Integrated Platform for Telecommunications is one of the first offerings based on the CGOF – a strategic framework defined by IBM in partnership with service providers, NEPs and other key industry players. CGOF is designed to serve as a structure for the end-to-end integration of open, next-generation telecommunications and enterprise solutions.

Solution-specific applications	Network applications		
Application services	Protocol services	Management/OAM&P application services	Telecom application services
Enablement applications **Middleware**	Signaling protocol stacks · Gateway protocol stacks · Parlay gateway · Parlay integration · OAM&P middleware · Database middleware · Portals/J2EE/Web services middleware		

Network element specific

Platform services	IP workload management services	Corba services	SM services	DM services	Java JDBC
	HA/Cluster messaging services				
OS	Carrier Grade OS enhancements				
	Standard and embedded operating systems				
Modular HW services	RAID SCSI	ASIC, HW acceleration	Device drivers	Firmware HW management	
Hardware	Storage	I/O adapters	Network cards	Processor/memory	

Security infrastructure and services

SI, test, support and training services

Network element common

	Network access infrastructure	Network transport infrastructure

Network element connectivity

Advantages of an on demand telecommunications provider

Responsive
Capable of quickly sensing and responding rapidly to emerging opportunities, while collaborating as needed with customers and partners to create new services – with minimal disruptions and staffing.

Resilient
Utilizes next-generation networks, shared processing and a reliable, autonomic, self-healing infrastructure. Security is maintained end-to-end– from the network, to applications, to processes, to business operations.

Focused
Directs resources at creating customer value, rather than dealing with disparate proprietary systems or less-than-optimal availability.

Variable
Utilizes capacity on demand – sharing infrastructure and processes across lines of business, and optimizing a variable cost structure for IT resources, applications and processes.

The IBM @server Integrated Platform for Telecommunications can also reduce network management costs while keeping availability – and customer satisfaction – high. Its many autonomic features respond dynamically to rapidly changing requirements – automatically configuring, optimizing, protecting, diagnosing and healing components, with minimal demands on staffs. Embedded security and privacy features further simplify operations, while extensive IBM support services can free even more staff time.

The platform also offers major opportunities for network equipment providers (NEPs), solution integrators and independent software vendors. Among the many companies already working on CGOF solutions are Cirpack, Lucent, Snowshore and Ubiquity. They and others recognize that the larger, higher-volume markets for open, standards-based products can generate higher revenues and better economies of scale for NEPs and other suppliers. Strategic partnerships and outsourcing arrangements will be far easier to arrange, with every party working from common standards. Pricing and marketing flexibility will increase, and product innovation and development will accelerate – leading to new revenue opportunities.

Off-the-shelf transformation: Platform components

The IBM @server Integrated Platform for Telecommunications is available in a flexible range of configurations. Readily scalable and easy to manage, it opens the door for telecommunications companies to dramatically transform their services, while broadening and enlarging their revenue streams.

Configurations encompass pre-integrated, pre-tested carrier-grade hardware and software, fully backed by support from IBM support services. To further expand the platform's capabilities, IBM plans to augment the offering with high-availability software to help ensure additional resiliency in systems, infrastructure and applications.

Hardware for the IBM @server Integrated Platform for Telecommunications can include:

BladeCenter T

- *IBM* @server *BladeCenter™ T and IBM* @server *BladeCenter systems* –High-performance, highly dense and scalable industry-standard computing platforms, designed to lower costs and reduce time-to-market:
  - *IBM* @server *BladeCenter T complies with Network Equipment Building System 3 (NEBS 3) and European Telecommunications Standard Industry (ETSI) requirements within a 20" deep chassis.*
  - *IBM* @server *HS20 (2-way) and HS40 (4-way) blade servers, switches and options can operate in either the new BladeCenter T or BladeCenter chassis – reducing complexity and simplifying consolidation of data network and data center infrastructures.*
  - *IBM* @server *JS20 64-bit PowerPC® processor-based 2-way blade server features innovative POWER™ technology and advanced SIMD capabilities, making it especially well suited for 64-bit high-performance computing (HPC) environments*

BladeCenter

**Key benefits of the
IBM @server Integrated Platform
for Telecommunications**

For service providers
- Lower cost and total cost
  of ownership
- Increased responsiveness to
  market opportunities
- Streamlined operations
- New revenue streams
- Improved customer loyalty

For network equipment providers
- Enhanced ability to address
  broader market opportunities
- Faster time to market
- Lower cost development
- Easier partnering and outsourcing
- Improved revenue growth and
  cash flow

- *IBM TotalStorage® Fibre Channel, SAN, NAS and Enterprise Storage Server® products* provide connected, protected and complete storage solutions for telecommunications environments – helping to make data storage easier and less costly to manage, and enhancing business efficiency and continuity.

Future releases will support IBM @server xSeries® systems featuring Intel® Xeon processors – providing outstanding availability and price/performance capabilities. These may include:

- *IBM @server xSeries 343 system* – a 2U, two-way high-performance, fully NEBS 3/ETSI compliant, 20" deep, carrier-grade, rack-mountable server optimized by IBM for telecommunications infrastructures.

- *IBM @server xSeries 335/x336 system* – a 1U, ultra-dense, high-performance two-way server designed to increase availability and lower costs for telecommunications companies and network equipment providers alike.

Software and middleware includes:

Carrier Grade Linux is available or planned from leading providers, such as Red Hat, SuSE and MontaVista, and designed according to the recommendations of the OSDL. As the charter of the OSDL's Carrier Grade Linux Working Group states, Carrier Grade Linux "will provide the availability and service response characteristics required by carrier-grade applications and yield the benefits of business control, economy and flexibility required to implement state-of-the-art, data-rich services."
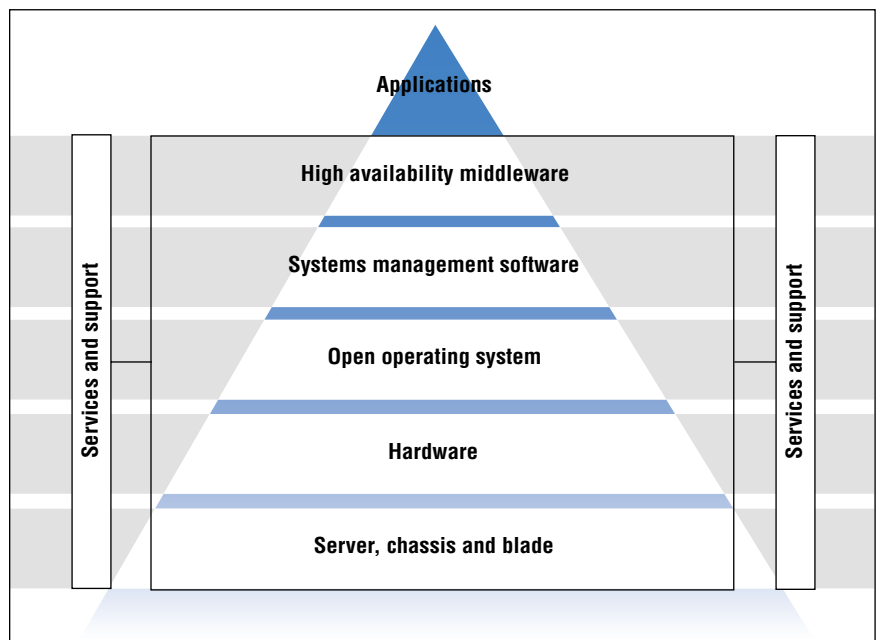
IBM Director workgroup software delivers comprehensive management capabilities that help reduce costs and improve productivity. Administrators can view and track remote systems and their processors, disks and memory. Features include self-managing smart tools, non-IBM support, GUI, and many others.

Recommended options, such as IBM high-availability middleware (planned)[*], to provide very high-speed failover, plus third-party middleware to support NGN applications.

IBM support services include installation, customization, maintenance and extended warranty. IBM offers an array of services based on proven disciplines and telecommunications experience. For a broader range of planning, consulting and migration services for complex environments, IBM Global Services can be engaged to deliver the IBM @server Integrated Platform for Telecommunications Extended Offering.

The IBM Integrated Platform for Telecommunications Extended Offering adds to the basic offering acclaimed IBM middleware such as IBM WebSphere, DB2 data management and Tivoli® software, plus other middleware from leading vendors – all backed by the full range of services and support offered by IBM Global Services.

The IBM @server Integrated Platform for Telecommunications deploys commercial off-the-shelf (COTS) applications on a pre-integrated and pre-tested platform of carrier-grade COTS components. All are based on open standards, backed by IBM services and support, and available through a single supplier and contact point…IBM.

Applications

High availability middleware

Systems management software

Open operating system

Hardware

Server, chassis and blade

Services and support

Services and support

Summary

Telecommunications service providers can now introduce new services faster and more economically by capitalizing on new, widely accepted standards for carrier-grade infrastructures. To assist companies, IBM has introduced the IBM @server Integrated Platform for Telecommunications – a family of proven, pre-integrated, off-the-shelf NGN solutions for converging voice, data and IP technologies. Enterprise functions and processes can be accommodated as well – affording true end-to-end integration. Through these and other offerings, IBM can help service and equipment providers leverage advanced, best-of-breed network and IT technologies to reduce costs, build revenues and increase profitability in a fast-changing, on demand world.

Find out more

For more information about the IBM @server Integrated Platform for Telecommunications, contact your IBM representative, or visit:

ibm.com/servers/eserver/bladecenter/ipt.html

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IBM @server **Integrated Platform for Telecommunications technical appendix**

Hardware			
Chassis		**BladeCenter**™	**BladeCenter T**
Voltage		220v AC	220v AC or -48v DC
Power supply modules		Up to 4 (redundant); 2 std.	Up to 4 (redundant); 2 std.
Cooling modules		4 (std.)	4 (std.)
Blade bays		14	8
Switch modules		Up to 4 (redundant)	Up to 4 (redundant)
Form factor		Rack 7 U	Rack 8 U
I/O ports		Keyboard, video, mouse, Ethernet, USB	Keyboard, video, mouse, Ethernet, USB
NEBS 3/ETSI		No	Yes
Systems management modules		1 std. (opt 2nd redundant)	1 std. (opt 2nd redundant)
Telco alarm panel		No	Yes
Common elements			
Blades	**Blade**	**HS20**	**HS40**	**JS20**
	Processor architecture	Intel® XEON DP (1/2) up to 3.2 GHz/533 MHz FSB	Intel XEON MP (1/4) up to 3.0 GHz/400 MHz FSB	Power PC® 970 1.6 GHz (2)
	Memory	Up to 8GB ECC	Up to 16GB ECC	Up to 4GB ECC
	Internal HD	Up to two 40GB ATA/100 IDE Up to 4GB IDE Flash	Up to two 40GB ATA/100 IDE Up to 4GB IDE Flash	Up to two 40GB ATA/100 IDE
	Network	2GB Ethernet	4GB Ethernet	2GB Ethernet
	I/O upgrade	1 expansion card	1 expansion card	1 expansion card
	OS support	Windows® 2003 and 2000 Red Hat Linux SUSE Linux	Windows 2003 and 2000 Red Hat Linux SUSE Linux	SUSE Linux (AIX® planned)
Switches	**Ethernet**	**IBM 4-Port**	**Cisco**	**Nortel**
	Speed (MB)	10/100/1000	10/100/1000	10/100/1000
	External ports	4	4	4
	Internal ports	14	14	14
	Layer	Layer 2	Layer 2	Layer 2-7
Fibre Channel Switches			**IBM 2-Port**	**Brocade Enterprise**
	External ports		2	2
	Internal ports		14	14

IBM @server® BladeCenter and BladeCenter T options

- SCSI expansion unit – enables the use of Ultra 320 SCSI HDDs

- PCI I/O Expansion Unit – enables the use of up to two 133 MHz PCI-X adapters; full size or half-height, 3.3v

- Fibre channel expansion card
- Gigabit Ethernet expansion card

Carrier Grade Linux Version 2.0 requirements *(General systems requirements)*

- STD.1.0 Linux Standard Base Compliance
- STD.2 POSIX Compliance
- STD.2.1 POSIX Core Functionality
- STD.2.2 Barriers
- STD.2.4 Clock Selection
- STD.2.6 IPv6
- STD.2.7 Monotonic Clock
- STD.2.8 Message Passing
- STD.2.10 Semaphores
- STD.2.11 Spin Locks
- STD.2.13 Threads
- STD.2.14 Timeouts
- STD.2.15 Timers
- STD.2.21 Thread Process-Shared Synchronization
- STD.2.24 Synchronization and Scheduling Support
- STD.3.0 SNMP Support Update
- STD.4.0 Stream Control Transport Protocol (SCTP)

- PLT.1.0 Persistent Device Naming
- PLT.2.0 IPMI 1.5 Support
- PLT.3.0 Service Availability Forum H/w Platform Interface
- AVL.1.0 Robust Mutexes
- AVL.2.0 Software ECC Support
- AVL.3 Software Live Installation and Upgrade
- AVL.3.1 Software Remote Upgrade and Installation
- AVL.3.2 Software Live Upgrade Minimal Reboot
- AVL.3.3 Software Live Upgrade RPM Version Check
- AVL.3.4 Software Live Upgrade Log
- AVL.4.0 Force Unmount
- AVL.5.0 Linux Panic Handler Enhancement
- AVL.6 Memory Overcommit Actions
- AVL.6.1 VM Strict Overcommit
- SVC.1 SNMP Support Upgrade

- SVC.1.1 SNMP Support for IPV4
- SVC.1.2 SNMP Support for IPV6
- SVC.1.3 SNMP Baseline MIBs
- SVC.1.4 SNMP IPv6 MIBs
- SVC.1.5 SNMP IPv6 Kernel Interface-Get
- SCL.1.0 Efficient Low-Level Asynchronous Events
- PRF.1.0 Soft Real Time Support Performance
- PRF.2.0 Managing Transient Data

Distributions that will support some/all of these requirements are: SUSE SLES and Red Hat Advanced Server.

Systems management

- Discovery
- Security
- Event management
- File transfer
- Inventory
- Process management
- Remote control
- Resource monitoring
- Job scheduling
- System health
- BladeCenter management

- Service processor management
- RAID management
- FirmWare updates
- SNMP management
- Command-line interface
- Upward integration modules
- Active PCI Manager
- Capacity management
- Rack manager
- Software rejuvenation
- System availability

Services available

- Hardware (chassis, blade, switch, blower, power, etc.)
  - Installation and configuration
  - Technical support and technical services
- Software (operating system, systems management, middleware, application)
  - Installation, configuration and preload

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