



z/OS Version 1 Release 9

For your most demanding data serving needs

October 2007



IBM Systems

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Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

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Value of z/OS V1.9

- **A system designed with system integrity at its foundation**
- **The place for your data and transactions**
 - Centralized security hub
 - Protecting your data and transactions
 - Support for new data and application technologies
 - Extreme scalability, availability, optimization
- **Improved TCO with broader use of specialty engines.**
 - zIIP Assisted IPsec and z/OS XML System Services enabled for zAAP
- **Simplifying the mainframe – improving productivity**
 - Simplifying diagnosis and problem determination, network and security management, as well as overall z/OS, I/O configuration, Sysplex, and storage operations.



Security still big news

**Security Flaw Exposes CVS Purchase Data;
50 Million customers exposed**

The Washington Post

**MasterCard security breached
More than 40 million cardholders may be affected**

MarketWatch

Ohio Sues DSW Over Customer Data Theft

ConsumerAffairs.Com

Bill would punish retailers for leaks of personal data

THE WALL STREET JOURNAL.

**Rogue Software Programmed to Wreak Havoc on
Target Web Sites**

The New York Times

z/OS System Integrity

Designed to help protect your system, data, transactions, and applications from accidental or malicious modification

- **z/OS system integrity**

- Intended to prevent unauthorized application programs, subsystems, and users from gaining access, circumventing, disabling, altering, or obtaining control of key z/OS system processes and resources unless allowed by the installation.
- System integrity is the inability to bypass the lock on system resources

- **Specifically, z/OS system integrity is defined as the inability of any program not authorized by a mechanism under the installation's control to:**

- Circumvent or disable store or fetch protection; or,
- Access a resource protected by the z/OS Security Server (RACF); or,
- Obtain control in an authorized state; that is, in supervisor state, with a protection key less than eight (8), or Authorized Program Facility (APF) authorized.



- **IBM will always take action to resolve if a case is found where the above can be circumvented**

z/OS integrity statement and the Common Criteria certifications can be helpful proof points in addressing compliance requirements.

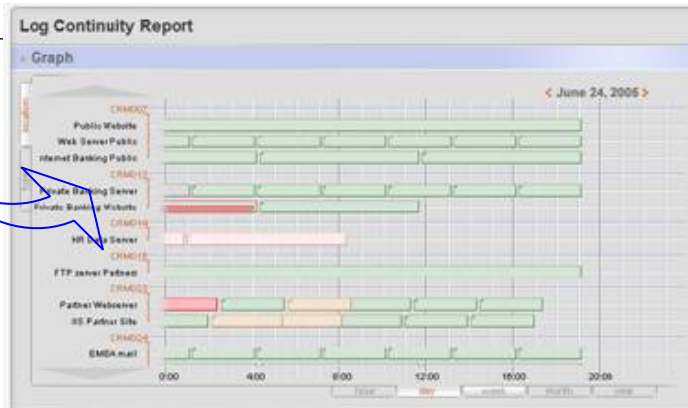
ibm.com/servers/eserver/zseries/zos/racf/zos_integrity_statement.html

z/OS Security Server – RACF

Addressing security and compliance* guidelines

Consistent, comprehensive logging

- **RACF can report if users have attempted to perform unauthorized actions**
 - All subsystems can log system event records
 - Comprehensive SMF records can document system activities
 - System audit records can report access to protected resources, security violations, unauthorized action
- **Tivoli Compliance InSight Manager (Consul InSight) *log continuity reporting* helps validate that logs have been collected – addressing a core compliance requirement**



RACF extended

- **RACF supports passwords/phrases up to 100 characters - easier to share passwords, tokens, key rings between systems**
 - 1-8 mixed case characters
 - 9-13 mixed case characters with new exit (ICHPWX11)
 - 14-100 mixed case – for IBM MW exploitation in future
 - Similar on z/OS and z/VM®
- **RACF support for passtickets (1.7)**
- **RACF support of virtual key rings (1.8)**
- **RACF support for Java user and group SAF admin class (1.9)**
- **RACF (and ICSF) support of PKCS#11 standard (1.9)**

Simplifying security management

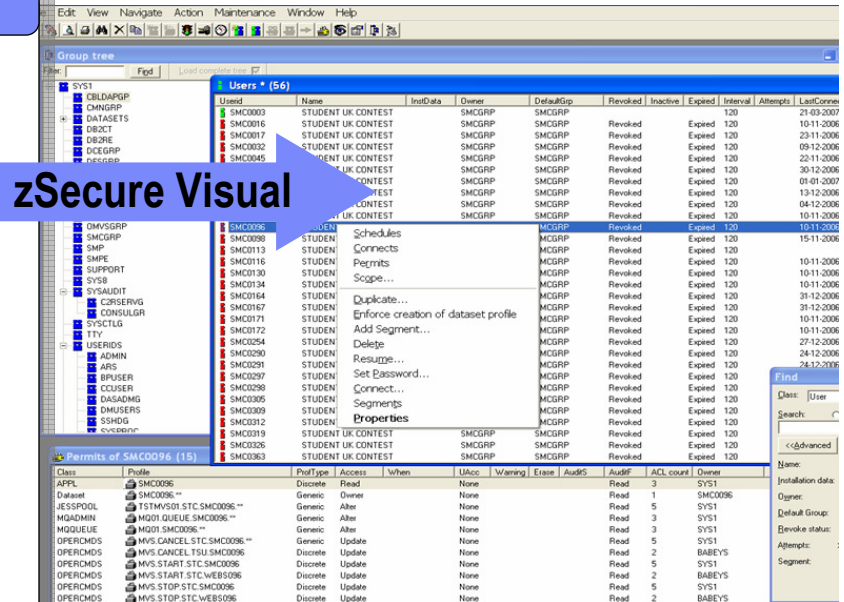
IBM Tivoli zSecure

Security Administration and Provisioning Products:

- zSecure Admin enhances user management
- zSecure Visual Reduces the need for scarce, RACF-trained expertise. Uses a Microsoft Windows-based GUI for RACF administration
- zSecure CICS Toolkit for simplified CICS® security management

Audit, monitoring, compliance Products:

- zSecure Audit* provides event detection, analysis & reporting and system integrity audit & analysis
- zSecure Alert** provides intrusion detection and alerting
- zSecure Command Verifier offers automated security monitoring

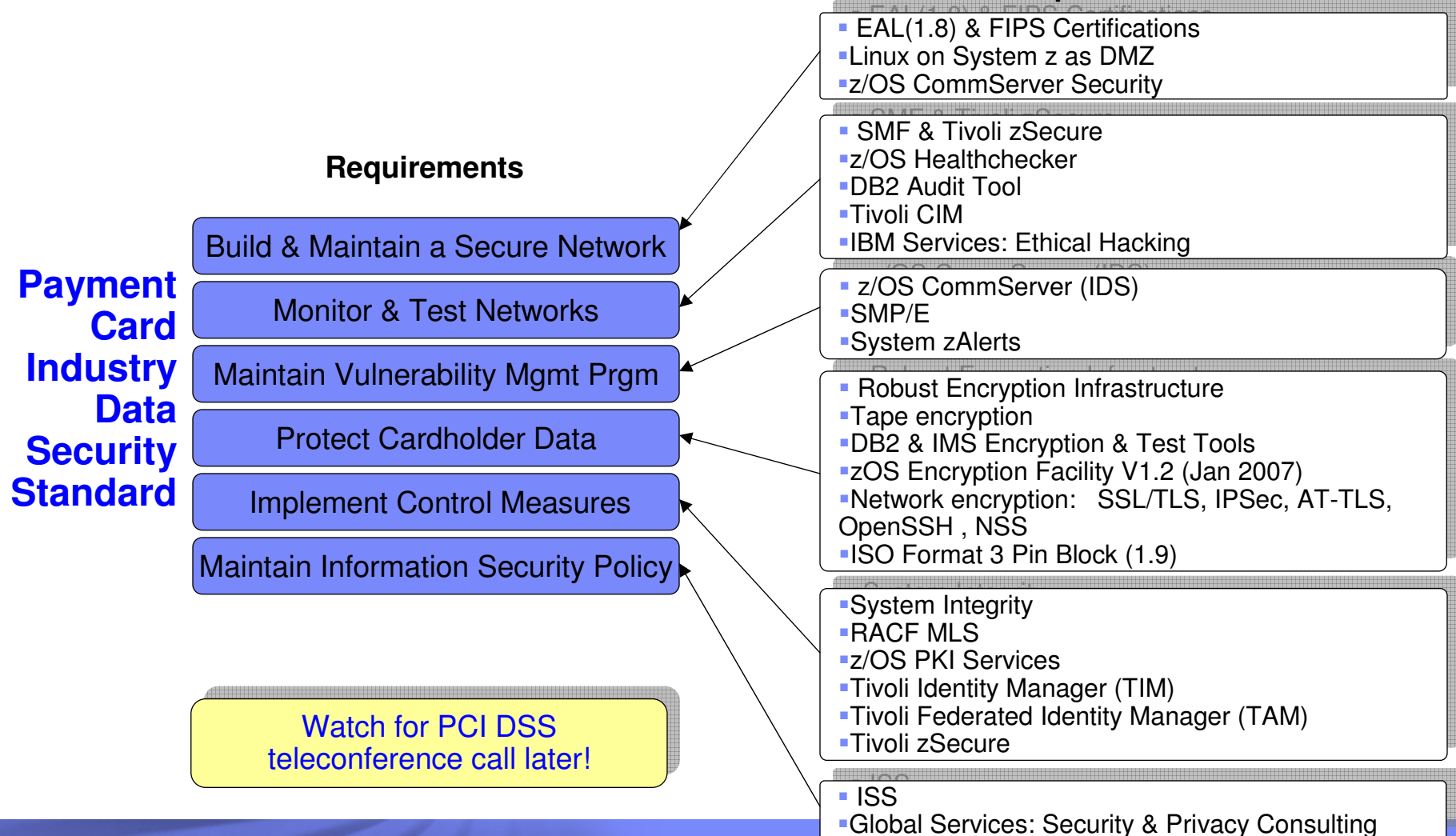


Additional programming improvements:

- Health Checker for z/OS helps check on RACF configuration settings (1.7 and 1.8)
- RACF user and group administration in Java (1.9)
- SYSREXX can help automate RACF admin and operator tasks (1.8 (web del.), 1.9 (native))
- Tivoli Directory Server (LDAP) provides simplified access, lookup, updates to RACF backend (1.8)

Payment Card Industry Data Security Standard

z/OS and System z technologies that help meet the standard



A complete digital certificate solution

z/OS PKI Services

- **z/OS PKI Services is a Certificate Authority solution provided in z/OS**

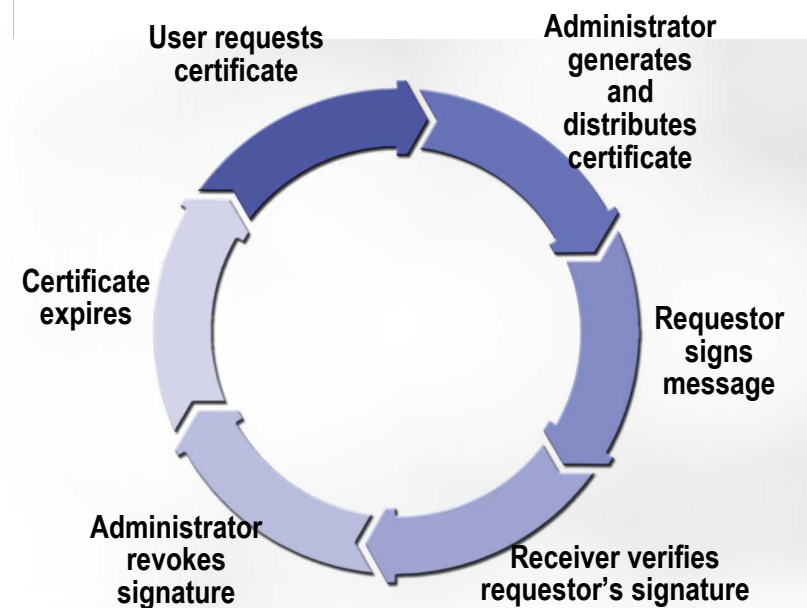
- Alleviate need to pay a third party Certificate Authority
- Relatively low MIPS to drive thousands of certificates
- Leverage existing z/OS skills and resources

- **Provides full certificate life cycle mgmt**

- User request driven via Web pages
- Browser or server certificates
- Automatic or administrator approval process
- Administered using the same Web interface
- End user/administrator revocation process
 - Deploys CRL (Certificate Revocation List) and OCSP (Online Certificate Status Protocol)

- **PKI Services, many updates over the years!**

- Multiple certificate authorities (in one image) (1.7)
- SCEP (Simple Certificate Enrollment Protocol) support to accept certificate request from network devices (routers) (1.8)
- Automated email notification for certificate requests, renewals, expirations (1.9)



Example of feedback

Used by a large bank to help secure connection between data center and branch offices - *Saved an estimated \$16M a year*

Centralized policy based networking

z/OS Communications Server

Policy-based networking value

- Define policies in one place and apply them uniformly across the IT environment
- z/OS Comm Server provides centralized distribution and management of networking policies for network Intrusion Detection Services (IDS), Quality of Service (QoS), IPsec (IP Security), and Application Transparent - Transport Layer Security (AT-TLS), NSS, and PBR.

▪ TCP/IP Policy-Based Routing (PBR) (1.9)

- Outbound network traffic can be separated by application needs
- Allows TCP/IP stack to make routing decisions based on job name, ports, protocol (TCP or UDP), source IP address, NetAccess security zone, and security label

▪ Network Security Services (NSS) (1.9)

- Provides single, centralized certificate storage, monitoring, and managing services for IPsec cross-systems or cross-sysplex

▪ Quality of Services (1.8) and Intrusion Detection Services (1.8)

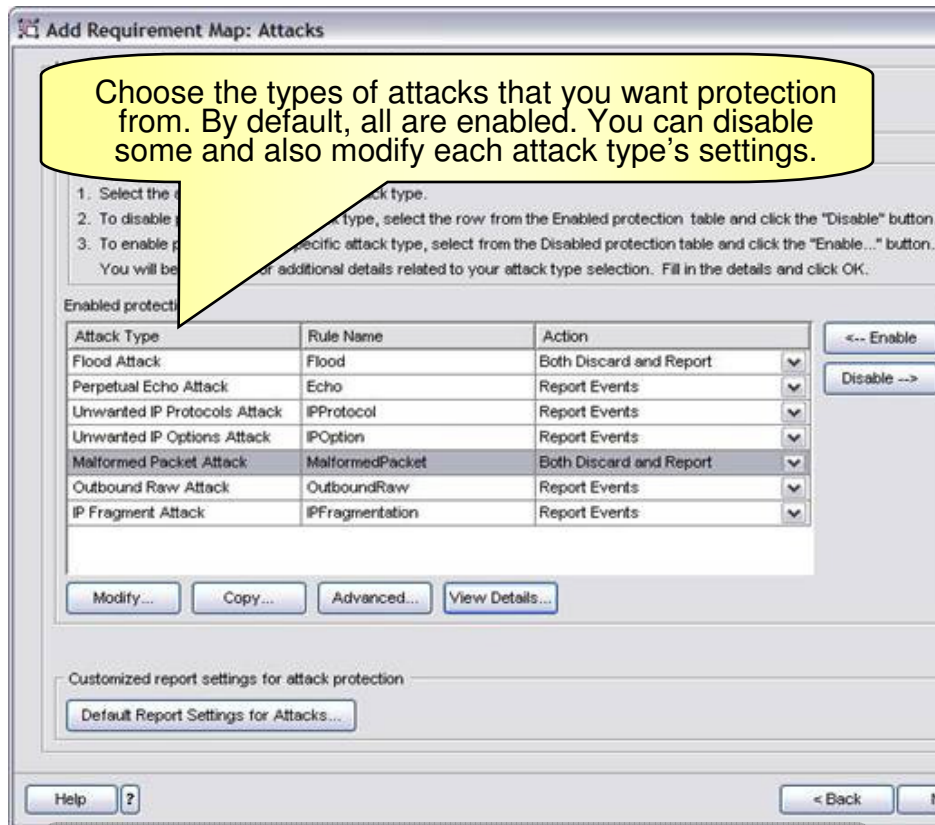
- Policy driven responses help maintain quality of network services and protection against suspicious activities

▪ Application Transparent -TLS (1.7) and IPsec (1.7)

- Simplified development and maintenance of security-rich Web apps - AT-TLS and IPsec can help you secure the network connection with no application modification.
- AT-TLS for FTP and TN-3270 (1.9)

Example - Intrusion detection made easy

Configuration Assistant for z/OS Communication Server (1.8)
z/OS Network Security Configuration Assistant (1.7)



Available as Web download!
ibm.com/support/docview.wss?rs=852&uid=swg24013160

Configuration Assistant Value

- Simplified setup, editing, and auditing of the following TCP/IP features for z/OS :
 - IP Security
 - Application Transparent-TLS
 - Quality of Service
 - Intrusion Detection Services
 - Network Security Services (1.9)
 - Policy-Base Routing (1.9)
- Ships with "best practice" default configurations.
- Performs self-checks of configurations; notifies when exceptions are detected.

Examples of feedback ...

- It helps tremendously, it simplifies configuration
- Tutorials and "Add for Beginners" helped to configure the required setting quickly.
- Tool looks promising and makes security management more transparent
- Quickly and easily configure security links within the network without the effort of writing all the different network parameters usually required to achieve this function.

Securing data in transit

zIIP Assisted IPsec

- **The z/OS Communications Server allows IPsec processing to take advantage of zIIPs**
- **zIIP Assisted IPsec function moves much of the z/OS IPsec processing from the general purpose processors to the zIIPs.**
 - Includes encryption processing, cryptographic validation of message integrity, and IPsec header processing.
 - Specifically, the z/OS Communication Server is designed to interact with z/OS Workload Manager to have all of its IPsec enclave Service Request Block (SRB) work made eligible to run on the zIIP.
- **Available with:**
 - z/OS 1.9 native
 - z/OS 1.8 Comm Server PTF (APAR PK40178) (July 2007)
 - z/OS 1.8 PTF (APAR OA20045) (July 2007)



Example of feedback

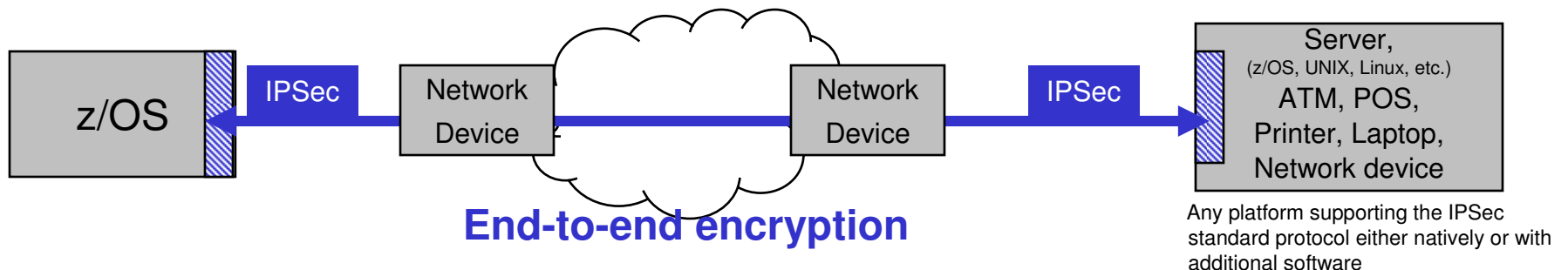
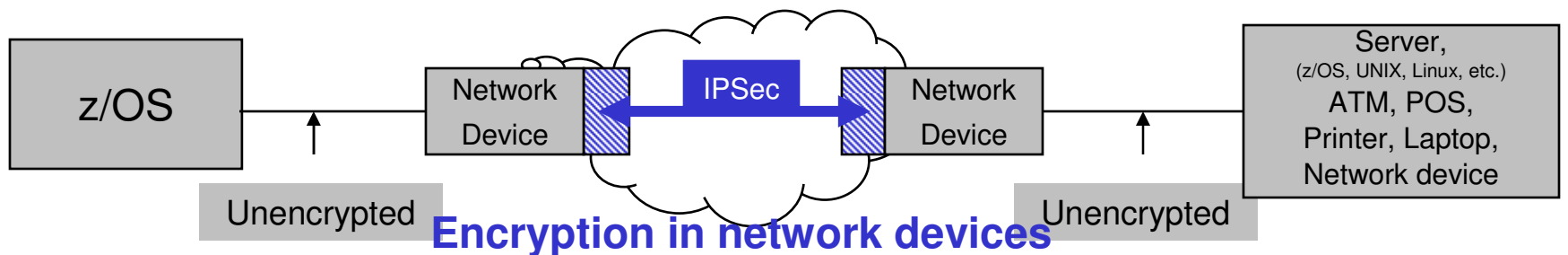
With the announcement of the zIIP Assisted IPsec, this solution delivers greater value to our business because of the improved price / performance provided by the zIIP specialty engine

**Ingemar Gustafson,
Manager of zSeries Networking
Svenska Handelsbanken**

A compelling network security solution

zIIP assisted IPSec

- End-to-end network encryption is becoming more pervasive due to **regulatory and enterprise security policies**
- End-to-end network encryption is also becoming a requirement for companies that **outsource some part of their network and want to have greater control of access to confidential data**

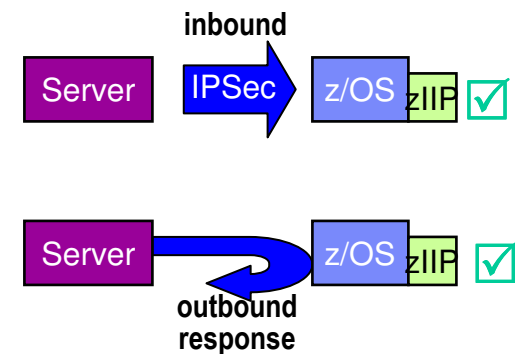


What IPSec workload is eligible for zIIP?

- The TCP/IP component of z/OS Communication Server recognizes IPSec packets and routes a portion of their processing to an independent enclave SRB – this workload is eligible for zIIP

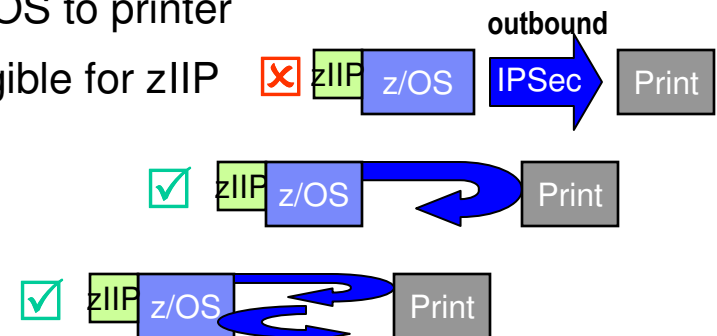
1) Inbound operation (not initiated by z/OS), example: traffic from server to z/OS

- All inbound IPSec processing is dispatched to enclave SRB and eligible for zIIP
- In addition, all subsequent outbound IPSec responses from z/OS are dispatched to enclave SRB
 - All encryption/decryption processing, cryptographic validation of message integrity, and IPSec header processing sent to zIIP



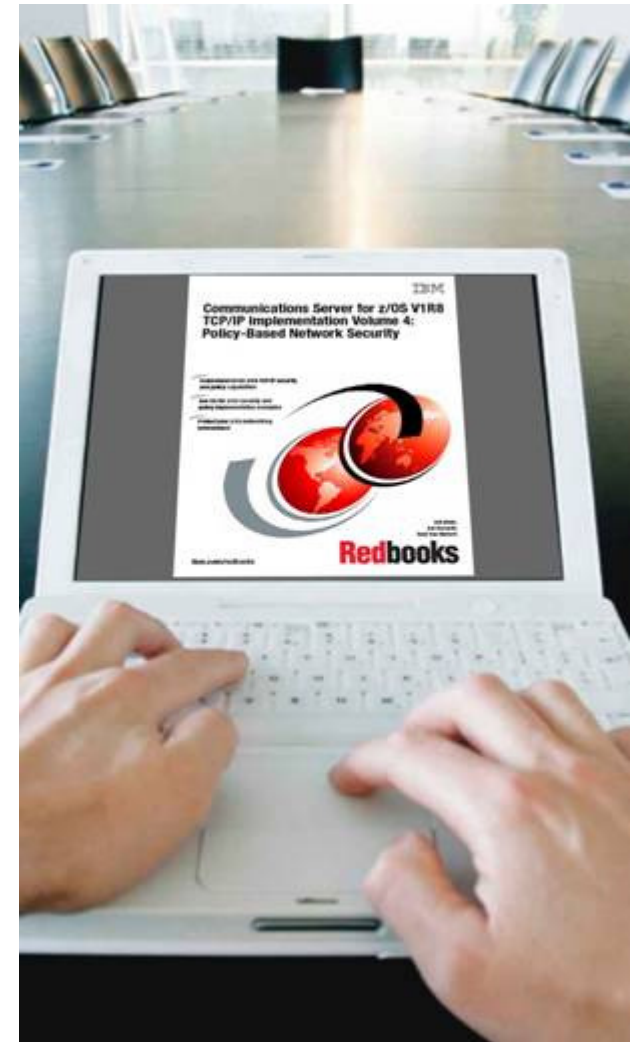
2) Outbound operation (initiated by z/OS), example: z/OS to printer

- Operation starts out in TCBs and therefore not eligible for zIIP
- BUT ... any inbound response/acknowledgement sends workload to SRB
- All subsequent outbound IPSec responses from z/OS are executed in SRB



zIIP assisted IPsec resources

- **What are the pre-requisites for zIIP assisted IPsec?**
 - z/OS 1.8 Communications Server PTF (APAR PK40178)
 - z/OS 1.8 PTF (APAR OA20045) (coreq for APAR PK40178)
 - System z9 with zIIPs
 - TCP/IP configuration statements:
 - IPCONFIG IPSECURITY (enabling IPsec support for IPv4) or IPCONFIG6 IPSECURITY (enabling IPsec support for IPv6), and
 - GLOBALCONFIG ZIIP IPSECURITY (enables eligible work to be directed to zIIP)
- **z/OS Communications Server page**
ibm.com/software/network/commserver/zos/security/
- **zIIP page**
ibm.com/systems/z/ziip/
- **Redbooks® – z/OS Network Security**
 - www.redbooks.ibm.com/redbooks/pdfs/sg247342.pdf
- **White paper “Capacity Planning for zIIP-Assisted IPsec”**
 - ibm.com/support/techdocs/atmastr.nsf/WebIndex/WP100988
 - ibm.com/support/docview.wss?rs=852&uid=swg27009459
- **Techdocs**
 - #PRS2745 WSC Experiences with IPsec on the zIIP Processor
 - #WP100988 Capacity Planning for zIIP-Assisted IPsec
 - #TD103516 Specialty Engine zIIP and zAAP Software Update



Adopting new application technologies

z/OS XML System Services eligible for zAAP

Available with z/OS V1.9:

1. z/OS XML System Services is enabled to take advantage of zAAPs.
2. IBM adds C/C++ support for z/OS XML System Services with z/OS V1.9

Statement of Direction, at a future date*:

1. IBM intends to enable the z/OS XML System Services to take additional advantage of zIIPs. (Specifically, 100% zIIP redirect, greater than currently for DRDA)
2. IBM also intends to extend and expand the use of z/OS XML System Services with:
 - IBM intends to enhance the XML Toolkit for z/OS so eligible workloads use z/OS XML System Services. This allows eligible XML Toolkit processing to exploit zAAP.
 - IBM intends to add validating parsing to the z/OS XML System Services. This extends zAAP and zIIP exploitation to include XML validating parsing workload as well.



What XML processing is eligible for zAAP?

- **Middleware and applications requesting z/OS XML System Services will have this z/OS XML System Services parsing eligible to execute on the zAAP.**
- **Specifically, all z/OS XML System Services parsing executing in TCB mode will be eligible for the zAAP.**

- **Example: DB2 9 utilizes z/OS XML System Services for a portion of its SQL/ XML via local connection - executing in TCB mode**
 - 1) Applications (queries) running locally on z/OS
 - When DB2 9 inserts or updates XML data, the data has to be parsed and therefore DB2 invokes z/OS XML System Services (and zAAP, when present)
 - 2) Utilities
 - When XML data is loaded into tables, then the XML data needs to be parsed and therefore DB2 9 invokes z/OS XML System Services (and zAAP, when present)

- **How much DB2 9 work is eligible for the zAAP will depend on amount of XML data being processed. (as a reminder, XML validation is not eligible for zAAP/zIIP (yet)).**
- **Guidance provided in Whitepaper “DB2 9 and z/OS XML System Services Synergy” ibm.com/support/techdocs/atmastr.nsf/WebIndex/WP101088**

z/OS XML System Services exploitation of specialty engines rolled out over time

Workload	Examples	Availability	Redirect	Requirements
z/OS XML System Services called in TCB mode <i>Please note, XML parsing performed in Java already eligible for zAAP</i>	XML non-validation parsing for: - DB2 9 inserting/ saving XML data, and XML table loads locally - any SW using z/OS XML System Services via Assembler or C interface in TCB (task) mode	Today (with z/OS V1.9 GA)	100% of z/OS XML System services parsing eligible for zAAP	z/OS 1.9 z/OS 1.8, OA20308 z/OS 1.7 w/ OA16303, OA20308 DB2 9 NFM The C API for XML System Services is available with z/OS 1.9, rollback APAR for both 1.7 and 1.8 is OA18713
z/OS XML System Services called in SRB mode from zIIP-eligible workload	XML non-validation parsing for: - DB2 9 inserting/ saving XML data over DRDA	Today	Same % as the zIIP-eligible work	z/OS 1.9, z/OS 1.8, z/OS 1.7 w/ OA16303 DB2 9 NFM
z/OS XML System Services called in SRB mode	XML non-validation parsing for: - DB2 9 inserting/ saving XML data over DRDA - any SW using z/OS XML System Services in SRB mode	SOD*	100% of z/OS XML System Services parsing eligible for zIIP	TBA*
z/OS XML System Services with validation	TBA*	SOD*	100% of z/OS XML System Services parsing eligible for zAAP (TCB mode) or zIIP (SRB mode)	TBA*
XML Toolkit for z/OS use of z/OS XML System Services (implies TCB mode)	Select workloads	SOD*	100% of z/OS XML System Services parsing eligible for zAAP	TBA*

Adopting new application technologies to access, display, update System z data

- **A new LDAP server for z/OS, IBM Tivoli Directory Server for z/OS, designed to improve performance, scalability, auditability, availability, and ease of use.**
 - New base element of z/OS
 - This function was available March 30 2007, available starting with z/OS 1.8.
 - May use a z/OS UNIX System Services flat file as a backing store
- **Perl (version 5.8.7)** - Part of Ported Tools for z/OS, available June 16, 2006
 - Perl is a very popular general-purpose programming. This port of Perl to the z/OS platform is preconfigured and precompiled for easier installation.
- **PHP (version 5.1.2)** - Part of Ported Tools for z/OS, available May, 2007
 - PHP allows users to generate customized Web pages, and to easily communicate with databases. PHP can also be used to write command line scripts, which can be used for a variety of tasks. This port of PHP is preconfigured and precompiled and easy to install. PHP can access to DB2 (through the DB2 ODBC driver)
- **bzip2** – Part of Ported Tools for z/OS Supplementary Toolkit for z/OS, June 2007
 - bzip2 is a powerful data compressing utility. Its usage syntax is intuitive and therefore makes it attractive for a wide audience and provides both compression and decompression capabilities.

Ported Tools for z/OS:

http://www-03.ibm.com/servers/eserver/zseries/zos/unix/port_tools.html

z/OS Supporting application development

- **New METAL C option in z/OS XL C/C++**
 - Use XL C for system program development not just application development
 - Can imbed HLASM statements in a C program, and Assembler calls to system services are allowed
 - No Language Environment run-time dependency

- **New decimal floating point formats support**
 - z/OS 1.9 XL C/C++ supports decimal floating point formats (in addition to hex and binary)
 - Decimal floating point arithmetic is often suited for business and financial applications

- **Improvement to the XL C/C++ feature of z/OS 1.9**
 - Performance enhancements take advantage of new instructions
 - Existing code can be recompiled to take advantage of the improvements

- **New XL C/C++ support in IBM Rational® Developer for System z 7.0 (5724-L44)**
 - Available for z/OS 1.8 XL C/C++ (Dec 2006)
 - XL C/C++ support for development, editing, content assist, enhanced code navigation, and remote syntax checking

- **z/OS dbx support for Rational Developer Debugger for System z 7.0 and Rational Developer for System z 7.0**
 - GUI for interactive, source-level debug - designed to let you examine, monitor, and control z/OS UNIX programs written in C, C++, and High Level Assembler

Rational Developer for System z - Simplified application development

Example: Correcting an error in COBOL source file

Currently:

- Start 3270 emulator
- Logon to the z/OS system
- Navigate to the dataset and member using ISPF
- Select the member for editing
- Locate the line in the source code
- Change the source code and save the member
- Switch to the JCL that is used to submit and schedule the compile job
- Submit the JCL job
- Switch to SDSF to monitor the job and review the output
- Repeat 5-9 until program runs correctly

With Rational (WebSphere) Developer for System z:

The screenshot displays the Rational Developer for System z environment. On the left, a 'z/OS dataset and file navigator' shows a tree view of datasets and members. The central pane is a 'Configurable source editor' displaying COBOL source code for a job named 'SAWDUST1 JOB'. The code includes JCL statements for dataset definitions and execution. On the right, a 'JES view for browsing job output' shows a table of job details, including job name, name, status, and type.

z/OS dataset and file navigator

Configurable source editor; write code, check syntax, submit compile job...all from one location

JES view for browsing job output

Property	Value
Context	TSO-CTFM508
Number of children	0
Status	Running
Type	Command Shell

```

Session A - [24 x 80]
File Edit View Communication Actions Window Help
Menu Options View Utilities Compilers Help
-----
DSLIST - Data Sets Matching LONGWEL.*          Row 1 of 145
Command ==>                                Scroll ==> PAGE
-----
Command - Enter "/" to select action          Message          Volume
-----
LONGWEL.@BIG10K.COBOL                        SM4224
LONGWEL.@BIG20K.COBOL                        MIGRAT2
LONGWEL.A.SEQ.PLI                             MIGRAT1
LONGWEL.ACCOUNT.FILE                          MIGRAT2
LONGWEL.ACCOUNT.FILE.DATA                     MIGRAT2
LONGWEL.ACCOUNT.FILE.INDEX                    MIGRAT2
  
```

z/OS Simplifying operations and programming

- **System REXX facility (SYSREXX) allows REXX code to run outside the TSO/E environment.**
 - Initiate REXX execs directly from operator console and run REXX routines in authorized environment.
 - Can imbed REXX commands from Assembler program.
 - Can help simplify operator assist functions & quick fixes when necessary
 - Easy way for Web Based Servers to run commands/functions & get back pertinent details
 - Method for system and application components to exploit REXX parsing strengths
 - Available as a no-charge Web download for z/OS 1.8 (pls use REXX Alt Lib), and native in z/OS 1.9
 - See the z/OS MVS Programming: Authorized Assembler Services Guide (SA22-7608)
- **Expanded IBM Health Checker for z/OS**
 - New health checks for z/OS UNIX System Services, TSO/E, the Virtual Storage Manager of z/OS BCP, and z/OS Communications Server.
 - Supports checks written with new SYSREXX facility - easier to write your own checks.
- **Configuration Assistant for z/OS Communications Server**
- **Hardware Configuration Manager – Need help with I/O management?** - Much new function and time-saving wizards with 1.8, improved reporting with 1.9
- **ISPF improvements** - Edit and browse UNIX and ASCII files with ISPF – one editor does it

Improving operations

- **Improved Consoles processing with Message Flood Automation**
 - Automation for dealing with large amounts of messages
 - Available with z/OS 1.6 and later with PTF, and z/OS V1.8 and V1.9 natively,
 - Helps prevent the flood messages from being displayed on a console, from being logged in the SYSLOG or OPERLOG, from being queued for automation, from propagating to other systems in a sysplex, from being queued to the Action Message Retention Facility (AMRF)
 - Helps take action against the address space issuing the flood messages, by issuing a command (typically a CANCEL command)

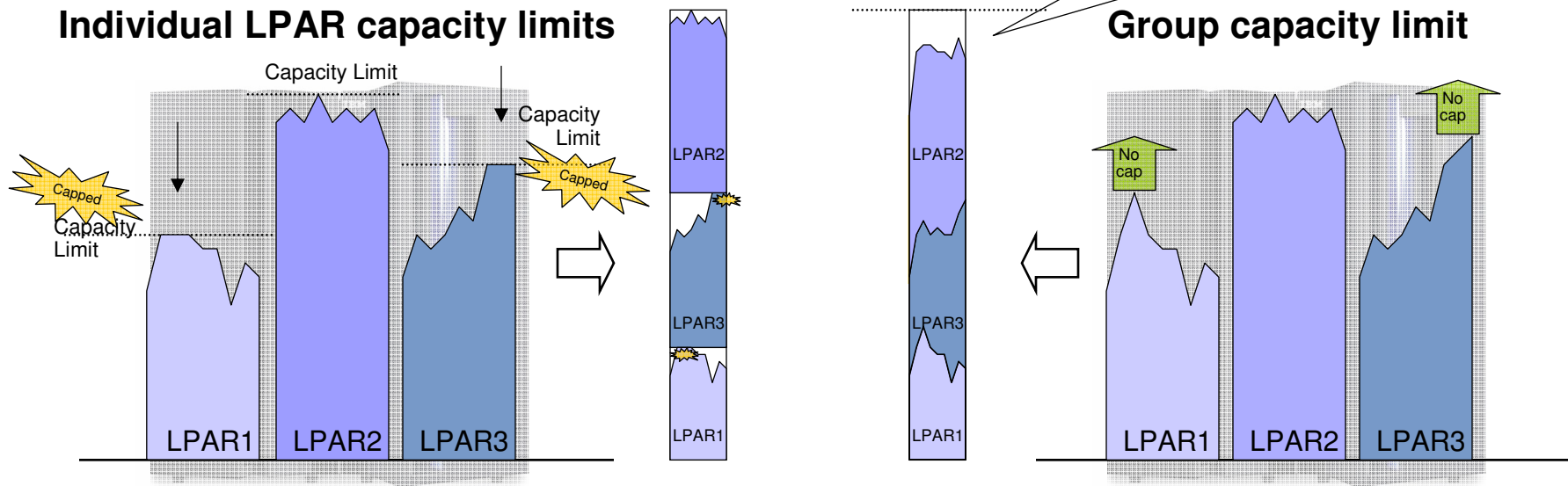
- **Improved record data collection, management, and performance monitoring - SMF can be configured to use System Logger to write data to a log stream. This is expected to:**
 - Allow support of far higher SMF data write rates when a coupling facility is used (as compared to writing to SMF data sets).
 - Collect more performance data during periods of high utilization
 - Allow you to specify different record types be written to separate log streams
 - Use different retention periods/ auditing processes for each log stream
 - Easier to go to and retrieve a particular time period
 - **ALSO:** System Logger availability is also improved with the ability to support multiple concurrent migrated data set requests for increased logger availability

Improving system utilization

LPAR Group Capacity Limits (GCL)

- **The ability to define a capacity limit for not only a single logical partition (LPAR), but for a group of LPARs as well**
 - System z to manage the group of LPARs in such a way that the sum of the LPAR capacity limits will not be exceeded.
 - Capacity limits based on four-hour rolling average
 - Available on System z9 EC and z9 BC only
 - Available April 2007 with z/OS 1.8 and up

! May help reduce the amount of 'capping'
 ! More productive use of 'white space' and higher utilization during 4-hour rolling average



Enhanced Sysplex

- **Parallel Sysplex improvements announced with z/OS V1.9:**
 - Improved **System-Managed Coupling Facility (CF) Structure Duplexing** – streamlined protocols are anticipated to make CF duplexing faster and may make it a viable option (Available 1Q 2008*)
 - Improved **Couple data set I/O** performance and throughput – any system that has significant I/O to Couple data sets will benefit from parallelism in XCF Couple data set access channel programs
 - **SFM (Sysplex Failure Manager for z/OS) improved with more** automatic identification, removal, and even termination of troubled systems in a sysplex
 - **RMF** support for CF utilization for improved CF performance monitoring
 - **CF management improvements**
 - CF REALLOCATE process shortened
 - CF maintenance mode
 - Improved reporting for performance and problem determination

- **Parallel Sysplex improvement announced with z/OS 1.8 - WLM services for “troubled applications” in a sysplex**
 - Designed so instances of distributed applications and subsystems can tell WLM they are having problems processing requests (e.g., full queues, abending, etc.)
 - WLM designed to adjust recommendations used by load balancers such as Sysplex Distributor to help avoid routing more work to the application having such a problem
 - WLM will pass abnormal transaction counts to Sysplex Distributor from subsystems that provide these counts (CICS, z/OS Comm Server, WebSphere Extended Deployment ...)

z/OS V1.9 Scalability, performance, availability

- **More capacity growth and workload support**
 - **54-way support** (the sum of CPs, zIIPs, and zAAPs) within a single system image
 - **64-bit GRS** dramatically increases the number of concurrent enqueues that can be supported
 - **TSO/E** support for large (>64K TRK) sequential data sets
- **OSA Express2 performance improved with z/OS Communication server Dynamic LAN Idle**
 - TCP/IP adjusts interruption interval for OSA-Express2 adaptors based on network traffic
- **Language Environment performance improved for:**
 - C/C++ and PL/I applications using heap pools
 - Any application using long long division and long long multiplication
- **z/OS UNIX File System (zFS) availability**
 - Reduced latch contention, Improved shutdown and recovery for AUTOMOVE, Improved auditing - new subtype of SMF type 92
- **RRS (Resource Recovery Services)**
 - Improved availability with reduced need for RRS restart
 - Improved diagnostics - Allows you to collect RRS information when needed and use this information for problem determination if any failure should occur later
- **Virtual storage constraint relief to support larger workloads**
 - **z/OS BCP Allocation's** dynamic storage moved above 16MB
 - Select **DFSMSHsm** buffers moved above 16MB
 - **IOS** (I/O Supervisor) configuration data tables moved above 31MB

z/OS V1.9 Optimization and management

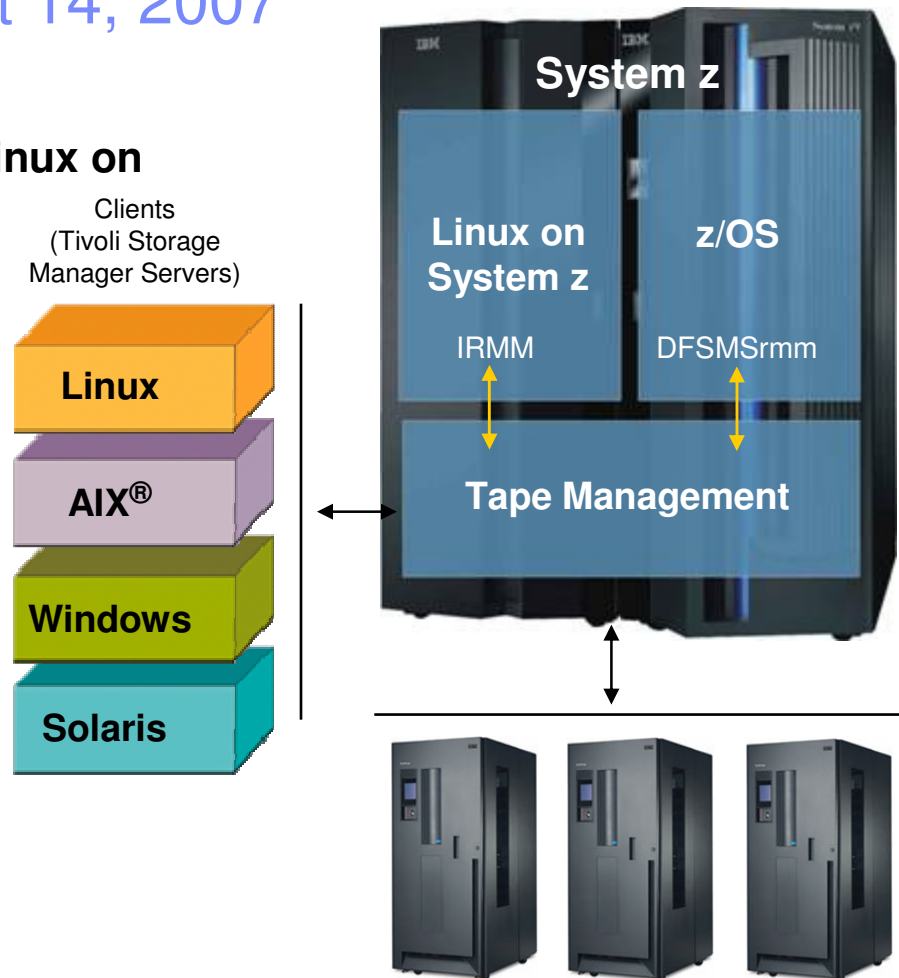
- **WLM routing services enhanced to recognize zAAP and zIIP capacity**
 - Routing services to return weights for zAAPs and zIIPs
 - Improved routing and management for zAAP and zIIP workloads
- **WLM “Trickle” Support**
 - Ability to devote a small amount of processor resource to work that otherwise would “never” get done on a 100% busy system
- **WLM Promotion of canceled jobs**
 - Increase priority of canceled jobs – helps get canceled work out of the system quickly so that held resources can be made available in less time
- **EWLM Application Response Measurement (ARM) 4.1 support**
- **Updated CIM (Common Information Model) Server for z/OS**
 - Upgrade of the CIM Server, upgrade of the CIM Schema,
 - Key extensions to the CIM Server for z/OS are the support for Automatic Restart Manager and authentication of clients through SSL certificates.
 - DFSMSrmm CIM support extensions

Enterprise-wide tape management on System z

Integrated Removable Media Manager for the Enterprise on System z (IRMM) 5655-S57, Sept 14, 2007

- IRMM is a robust middleware product for Linux on System z. IRMM is designed to :

- Combine the capacity of multiple heterogeneous tape libraries into a single virtual reservoir of tape storage
- Help increase administrator productivity and efficiency with centralized access control, policy-based administration, monitoring, and reporting
- Integrate with mainframe removable media management to provide a central point of management and control for both open systems and z/OS tape
- Help increase resource utilization and help reduce TCO of tape management



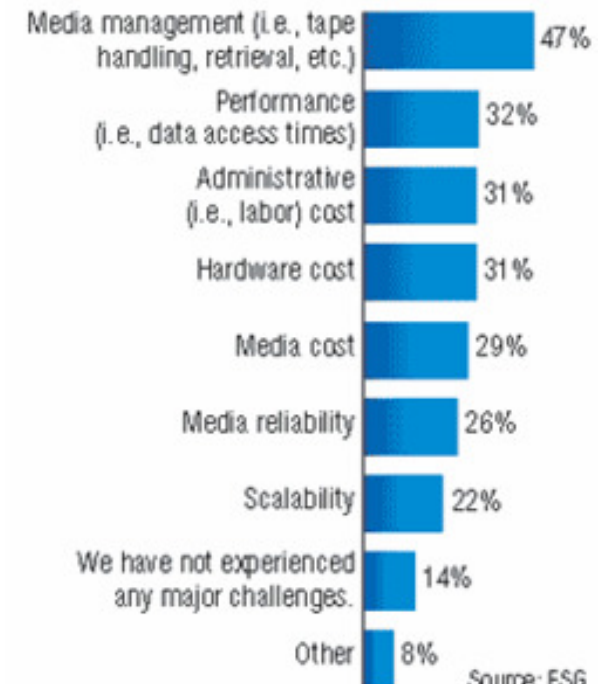
Today's tape and media management challenges

- **Customers increasingly have a need for consolidated tape / media management solutions**
 - Few tools for open systems tape / media management beyond what's built in to backup/archive applications
 - z/OS and open systems attached tapes are managed separately - duplicate administration effort

- **Hardly any dynamic resource sharing**
 - Not among open systems and not among z/OS and open systems
 - Dedicated hardware resources have to be managed separately
 - Inefficient utilization of tape resources

Challenges with existing tape libraries

Q: What are the biggest challenges with your existing tape libraries?
(multiple responses accepted)



IRMM Value

Infrastructure simplification and resource optimization to help drive:

▪ **New efficiencies with DFSMSrmm**

- Can use the *same* DFSMSrmm inventory to manage removable media for z/OS *and* for distributed
- Extend DFSMSrmm function to distributed: Manage vaulting, retention, media retirement

▪ **Increased productivity**

- Centralized media management, administration, and reporting
- Simplified, flexible drive provisioning
- Integration with Tivoli Storage Manager Configuration & Maintenance and Tivoli Enterprise Console products
- Monitoring & Reporting

▪ **Increased resource utilization**

- Implement a common scratch pool.

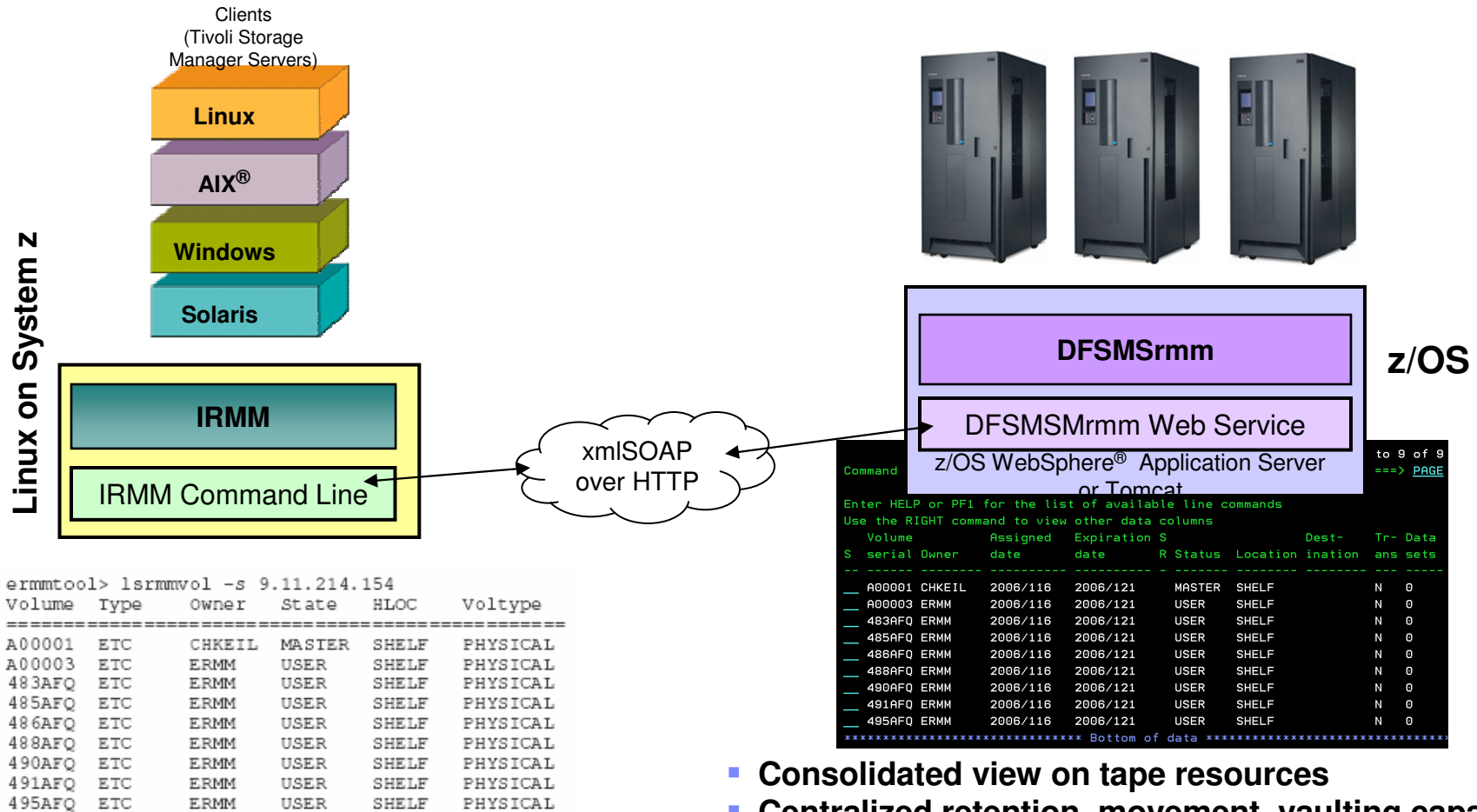
▪ **Reduced TCO for removable media infrastructure by:**

- Centralizing management, administration and reporting services
- Enhancing resource utilization through intelligent, dynamic sharing of libraries, drives and cartridge pools
- Virtualizing libraries, drive pools and cartridge pools
- Helps to eliminate changes or downtime for upgrading storage technology

▪ **Enabling enhanced media protection and security by:**

- Tracking the whole media lifecycle including “in-transit” and offsite locations
- Security model including access control

Integrating IRMM and DFSMSrmm



- Consolidated view on tape resources
- Open systems interface to DFSMSrmm

- Consolidated view on tape resources
- Centralized retention, movement, vaulting capabilities
- Policy-based management of ALL cartridges
- Operator can use z/OS to manage both z/OS and distributed environments

Migration Checker for z/OS

Simplifying migration to z/OS 1.8, 1.9

No charge Web download

Value

- When run on the older system, Migration Checker for z/OS can help you determine if **migration actions** are applicable
- When run on the new target system, Migration Checker for z/OS can help **verify migration actions** have been done correctly.
- Best used in conjunction with z/OS Migration book, to assist in creating your migration plan.
- Intended for migrations from z/OS 1.7 to z/OS 1.8 or 1.9, or from 1.8 to 1.9, with some checks useful for other migration paths.

Watch for Migrating to z/OS 1.9
teleconference call later!

ibm.com/servers/eserver/zseries/zos/downloads/#mchecker

Examples of feedback ...

- New and experienced users like it
 - Nice tool.... Valuable tool.... Great tool.... Love the tool....
- Results were informative and clear on what actions to take.
- A great idea that will improve as time passes.
- One of the best ideas I've seen from IBM in a long time.
- Migration Checker aided in finding parameters and configuration issues that needed modification before and after the install of z/OS.

Migration Checker will not ...

- Perform any migration actions on your system
- Replace the z/OS Migration books. The Migration Checker for z/OS programs do not cover all migration actions outlined in the Migration books.

Thank you!

- **IBM's commitment to the mainframe delivers:**

- Centralized security hub
- Protecting your data and transactions
- Support for new data and application technologies
- Extreme scalability, and availability

- **IBM is investing in mainframe simplification and modernization:**

- We're making z/OS systems easy to set up, operate, and administer
- We're delivering a modern, easy to use development environment.





Questions?

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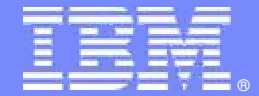
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Backup

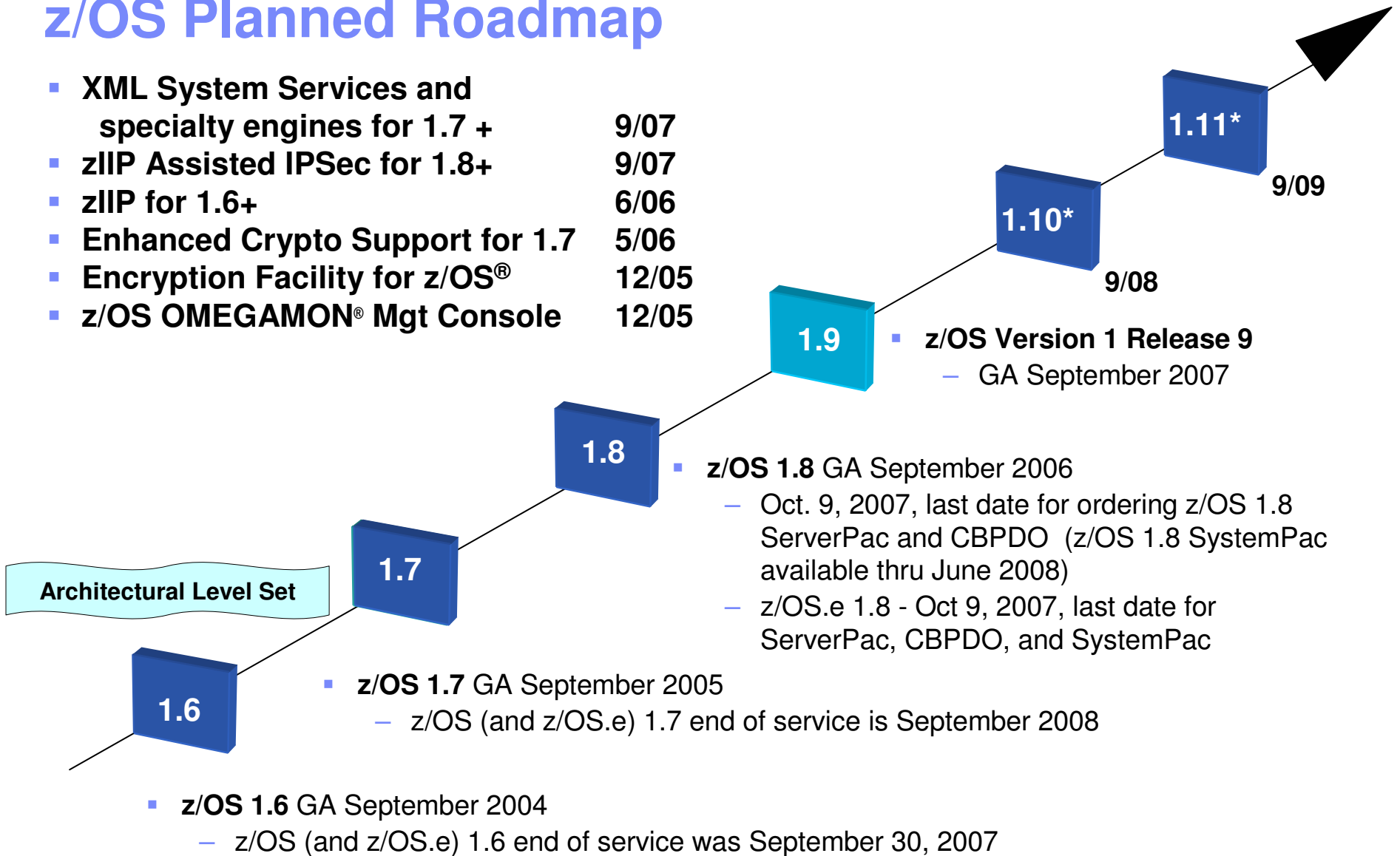


IBM Systems

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z/OS Planned Roadmap

- XML System Services and specialty engines for 1.7 + 9/07
- zIIP Assisted IPsec for 1.8+ 9/07
- zIIP for 1.6+ 6/06
- Enhanced Crypto Support for 1.7 5/06
- Encryption Facility for z/OS® 12/05
- z/OS OMEGAMON® Mgt Console 12/05



z/OS Support Summary



z/OS	G5/G6 Multiprise 3000	z800	z890	z900	z990	z9 EC	z9 BC	DS8000 DS6000	TS1120	End of Service	Coexists with z/OS...	Planned Ship Date
R4	X	X	X ¹	X	X ¹	X ¹	X ¹	X	X ¹	3/07	1.7	
R5	X	X	X	X	X	X	X	X	X	3/07	1.8	
R6		X	X	X	X	X	X	X	X	9/07	1.8	
R7		X	X	X	X	X	X	X	X	9/08	1.9	
R8		X	X	X	X	X	X	X	X	9/09*	1.10*	
R9		X	X	X	X	X	X	X	X	9/10*	1.11*	9/07
R10*		X	X	X	X	X	X	X	X	9/11*	1.12*	9/08*
R11*		X	X	X	X	X	X	X	X	9/12*	1.13*	9/09*

■ z/OS 1.9 Coexistence-supported releases*

Release

z/OS 1.9
z/OS 1.10*
z/OS 1.11*

Coexistence-supported

z/OS 1.7, z/OS 1.8, z/OS 1.9
z/OS 1.8, z/OS 1.9, z/OS 1.10*
z/OS 1.9, z/OS 1.10*, z/OS 1.11*

z/OS.e 1.3, 1.4, 1.5, 1.6, 1.7, 1.8 supported on z800, z890, and z9 BC only. There is no z/OS.e 1.9

x¹ – IBM eServer zSeries 990 (z990) compatibility or exploitation feature required (no longer orderable)

z/OS 1.9 Migration Considerations (from z/OS 1.7)

- **BCP 1-byte console ID support removal (z/OS 1.8)**
 - Still use the Console ID racking Facility
 - Change programs that reference unsupported console functions.
- **Remove your run-time dependency on the C/C++ IBM Open Class[®] Libraries (1.9)**
 - Use the Standard C++ Library instead
- **SNA Services – Remove AnyNet definitions (z/OS 1.8)**
 - Consider Enterprise Extender
- **Run the TN3270 telnet server as a separate address space (z/OS 1.9)**
 - Must do this before R9 to keep Telnet functions
- **DFSMSHsm copy pool R8-format coexistence (z/OS 1.8)**
 - FRBACKUP against a copy pool converts to R8 format, then, only fast replication command on pre-R8 system is FRRECOV from DASD
- **JES2 – some changes (z/OS 1.9)**
 - A lot less than R7 ... Exits 8, 31, 42, 45, and any exits using JCTID.
- **It is recommended to migrate from HFS to zFS**
 - zFS is the strategic file system for z/OS UNIX and continues to be enhanced to provide superior performance, reliability and data integrity.

Statements of Direction* (Aug. 2007)

IBM plans to take the following actions in the future:

- **Support for the VSAM KEYRANGE attribute will not be withdrawn as stated in announcement letter 204-180, dated August 10, 2004.**
 - IBM recommends that you minimize or eliminate your use of KEYRANGE. Striped data sets are expected to provide better performance than KEYRANGE, and can be viewed as a good replacement for KEYRANGE data sets.
- **VSAM data set IMBED or REPLICATE attributes will be removed in the future.**
 - Using these attributes for existing data sets can waste DASD space and can often degrade performance. IBM recommends that you stop using these attributes.
- **z/OS 1.9 will be the last release to support CPU affinity**
 - Meaningless/ obsolete since introduction of PR/SM in most all cases
 - Attempts to assign CPU affinity will be ignored by future releases
- **In a future release, Communications Server will remove support for:**
 - Network Database (NDB) function; consider using the distributed data facility (DDF) provided by z/OS DB2, and the DB2 Run-Time Client instead.
 - The DHCP server; consider replacing it with a DHCP server on Linux for System z.
 - The Boot Information Negotiation Layer (BINL) function; consider using IBM Tivoli Provisioning Manager for OS Deployment in its place.

Statements of Direction* (Jan. & Feb. 2007)

IBM plans to take the following actions in the future:

- **IBM plans that z/OS 1.9 will be last release to support ISPF panels in DFSORT®**
 - Support for JCL to sort, copy or merge will continue to be available.

- **z/OS 1.9 is planned to be the last release of z/OS Communications Server which will support the configuration of Traffic Regulation (TR) policy as part of the Quality of Service discipline.**
 - The TR configuration function remains supported, but IBM recommends that you implement it as part of the Intrusion Detection Services (IDS) policy configuration made available in z/OS 1.8.

- **To replace both the z/OS.e operating system and the NALC pricing metric with the zNALC pricing metric. IBM intends:**
 - For z/OS.e Version 1 Release 8 to be the final release of the z/OS.e operating system.
 - To allow ordering of z/OS.e 1.8 until the planned withdrawal from marketing in October 2007. IBM intends to provide service for z/OS.e 1.8 until its planned end of service in Sept. 2009.
 - To continue marketing of the NALC pricing metric until fourth quarter 2007 after which you cannot request NALC pricing for any OS/390 or z/OS license

Simplifying access to z/OS skills!

- **Academic Initiative - The infrastructure is complete, time to leverage it**
 - Enabling students and faculty
 - Faculty seminars and workshops
 - No-charge access to remote mainframe hubs WW
 - Courses and e-Learning
 - Mastery Test & Student Opportunity System
 - Student Mainframe contests
- **z/OS Basic Skills Information Center for new and experienced users**
 - publib.boulder.ibm.com/infocenter/zoslnctr/v1r7/index.jsp
 - z/OS Basics publication as well as interactive courses
- **IBM Education Assistant (IEA)**
 - ibm.com/software/info/education/assistant/
 - Click on 'Other Systems'
 - Online education on z/OS performance, tuning, and best practices tips
- **Application development simplification**
 - Rational (WebSphere) Developer for System z
ibm.com/software/awdtools/devzseries/

Mainframe Skills Help Desk
(zskills@us.ibm.com)

