

The Modern Mainframe... At the Heart of Your Business

End-to-End Security and Compliance

Evolving Regulations Point to the Need for More Automated Compliance Reporting

	<i>Regulatory Impact</i>					
	<i>Secured Data</i>	<i>Workflow</i>	<i>Reporting</i>	<i>Risk Assessment</i>	<i>Encrypted data</i>	<i>Secured Storage Management</i>
Basel II	✓	✓	✓	✓	✓	
HIPAA	✓	✓	✓		✓	✓
Sarbanes-Oxley	✓	✓	✓	✓	✓	✓
Gramm Leach-Bliley	✓		✓			
AML - Patriot Act	✓		✓		✓	

IBM Service Management Market Needs Study, March 2006

Service Oriented Finance Security Requirements

We have a lot of security requirements



Service Oriented Finance CIO

Your security strategy should include these key elements:

- Secure platform
- Data privacy
- Compliance and audit
- Manage security across the extended enterprise



IBM

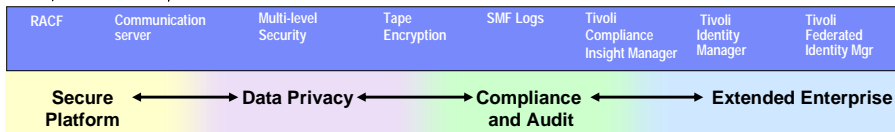
Questions Auditors Might Ask



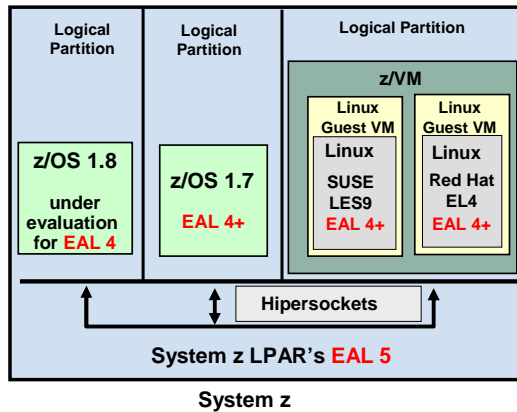
Auditor

How do you prevent unauthorized access?

Do you know if anyone attempted an attack on the mainframe?



Common Criteria Certifications Show System z Platform Security Leads the Industry



■ What is Common Criteria?

- ▶ Common Criteria is an accepted standard for evaluating the inherent security of a computing system
- ▶ A higher EAL rating is more secure
- ▶ The security requirements in Common Criteria have gained support as "best practices"
- ▶ **IBM System z holds the highest EAL grades in Common Criteria!**

- Crypto Cards rated at FIPS 140-2 level 4

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Security Begins with System z Secure Processing

- Workload Isolation
 - Isolation of users in a separate address space
 - Processing integrity with LPAR separation
 - System programs separated from user programs
- Not Harmed by Malware
 - Viruses cannot be readily introduced
- Communications
 - Internal Hipersocket communications not easily intercepted
- Authorized Program Facility (APF)
 - Executable code can be invoked only by authorized users
 - Cross memory services prevents unauthorized access
- System Integrity Statement
 - IBM accepts responsibility for integrity exposures found by customers

- **System z is a hacker's nightmare!**
- **Allows customers to run multiple workloads on single image**
- **Stops viruses and worms from disrupting operations**

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RACF* – At the Heart of System z Security

- RACF controls authorization and authentication
 - ▶ Identifies and authorizes users
 - ▶ Controls access to resources
 - ▶ Authenticates users through passwords or (PKI) digital certificates
 - ▶ Provides auditing and logging
 - ▶ Enables central administration of several systems

- RACF structure is enforced automatically
 - ▶ System blocks unauthorized attempts
 - ▶ You cannot bypass RACF

- RACF is integrated with System z Middleware
 - ▶ Transaction monitors, DB2
 - ▶ CICS, IMS, WebSphere

These resources are protected by RACF

- | | |
|---------|-------------|
| ▶ DB2 | ▶ JES 2 & 3 |
| ▶ VSAM | ▶ Console |
| ▶ IMS | ▶ VTAM |
| ▶ CICS | ▶ SDSF |
| ▶ TSO | ▶ WebSphere |
| ▶ Disk | ▶ MQ |
| ▶ Tape | ▶ Programs |
| ▶ Print | ▶ Keys |

Integrated Security across the platform

* Resource Access Control Facility

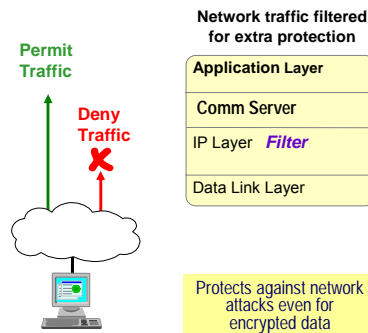
Built in Security to Defend Against Network Attacks

- Intrusion Detection from Communications Server enables detection of network traffic attacks

- Automatic application of defensive mechanisms
 - ▶ Evaluates inbound encrypted data for suspect activity
 - ▶ Policy controls connection limits, packet discard
 - ▶ Detects anomalies in *real-time*
 - ▶ Avoids *overhead* of per packet evaluation against known attacks

- Scan detection and reporting
 - ▶ Can map the target of an attempted attack

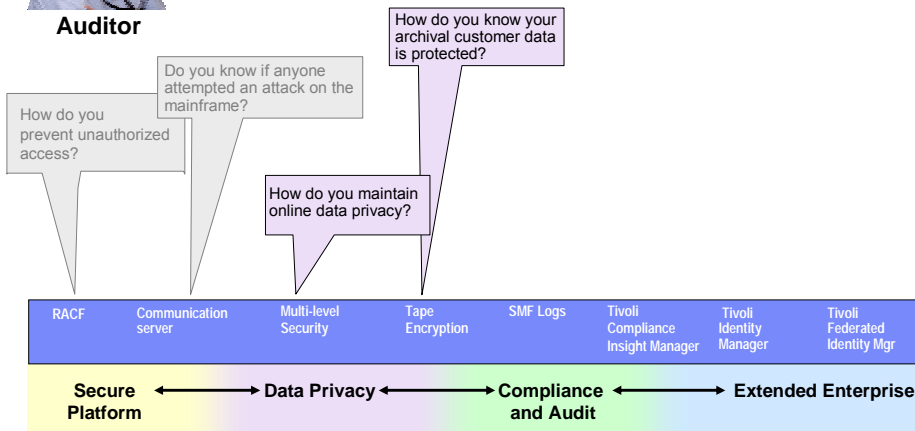
- Integrates with Tivoli Security Operations Manager



Questions Auditors Might Ask



Auditor



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The Foundation of Data Privacy is Encryption

Free - CP Assist for Cryptographic Function (CPACF)

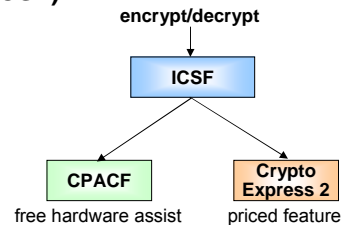
- Each system processor has hardware assist on the chip for cryptography
- CPACF provides cryptographic functions for encryption and decryption of data
 - ▶ Used for SSL, VPN, and data storing applications
 - ▶ includes DES, T-DES, AES, SHA-1 and SHA-256 hashing

Priced Feature - Crypto Hardware Processor Card

- Crypto Express 2 (\$38K per card)
- High performance, tamper proof environment for secure key cryptography
- 6000 Secure Socket Layer handshakes per second
- Key is encrypted in hardware and never exposed

Integrated Cryptographic Service Facility (ICSF)

- Provides API's for encryption via CPACF or Crypto Express2
- Routes work to the appropriate crypto processing resource
- Included in z/OS
- Used to administer the cryptographic hardware and keys



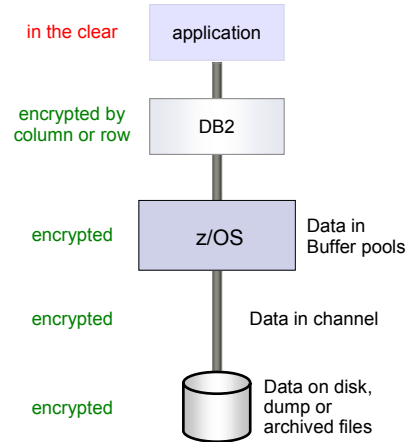
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DB2 Encryption Protects Data Privacy in the Database

- Encrypted by DB2
 - ▶ Table and Index encryption
 - ▶ Image copies encrypted
 - ▶ Logs/archives encrypted
 - ▶ Data encrypted in buffers
 - ▶ Data sent by DRDA
 - ▶ Data not exposed!

- DB2 uses encryption to protect the data:
 - ▶ Column level encryption
 - Enabled by the application
 - ▶ Row level encryption
 - IBM Encryption Tool for DB2
 - Optional feature



DB2 Multi Level Security

Goals of Compartmentalized Data

- Same database used by organizations with a different need to know
- Prevent unauthorized individuals from accessing information at a higher classification than authorized
- Prevent unauthorized declassification of information

DB2 Multi Level Security

- Restricts row level access to those with appropriate security clearance
- Mix low and high security data in the same database

SECURITY Classification	Revenue	Area	Loss
Executive	234	USA	3%
Finance Secret	198	Ohio	13%
Executive	2	Maine	29%
Finance Confidential	234	USA	11%
Finance Secured	87	Texas	14%
Finance Secured	23	New York	20%
Audit Confidential	223	USA	10%
Finance Secured	45	Canada	29%

Executive Risk Analyst

Bank analyst

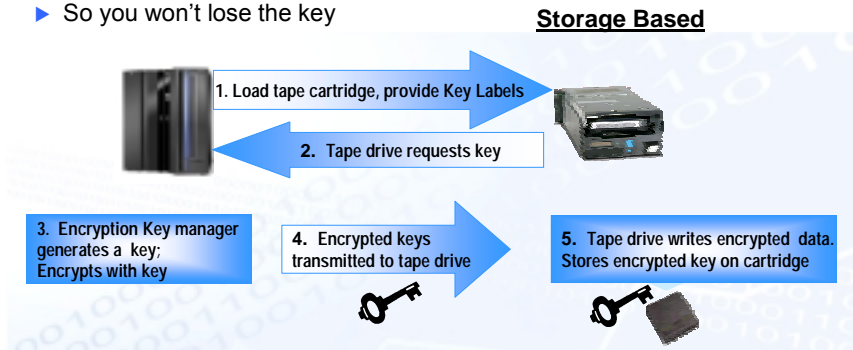
Internal auditor

Single image of data is sharable by multiple enterprise departments with different levels of "need to know"

With DB2 Multi Level Security data can be consolidated onto a single database, restricting access to only authorized users

Optional Ability to Automatically Encrypt All Data on Tape

- High performance tape encryption
 - ▶ Standard feature on all new TS1120 Tape Drives
 - ▶ Cost effectively encrypt all tape data
 - ▶ Offload host processing encryption overhead
 - ▶ Minimize impact to existing processes and applications
- Leverages System z Key management
 - ▶ So you won't lose the key

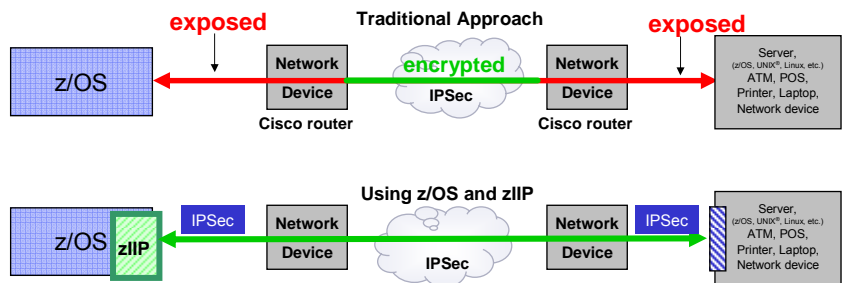


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Provide End-to-End Encryption at Low Overhead

- The need for *end-to-end* network encryption has become more pervasive due to regulations (e.g. Payment Card Industry requirements)
- Traditional router-based network encryption leaves data exposed
- Data encryption has always been processing intensive
 - ▶ System z Communication Server uses crypto express 2 to encrypt network data end-to-end
 - ▶ Encryption is now eligible for **zIIP** offload processing – reducing costs



“end to end” encryption

Any platform supporting the IPSec standard protocol either natively or with additional software

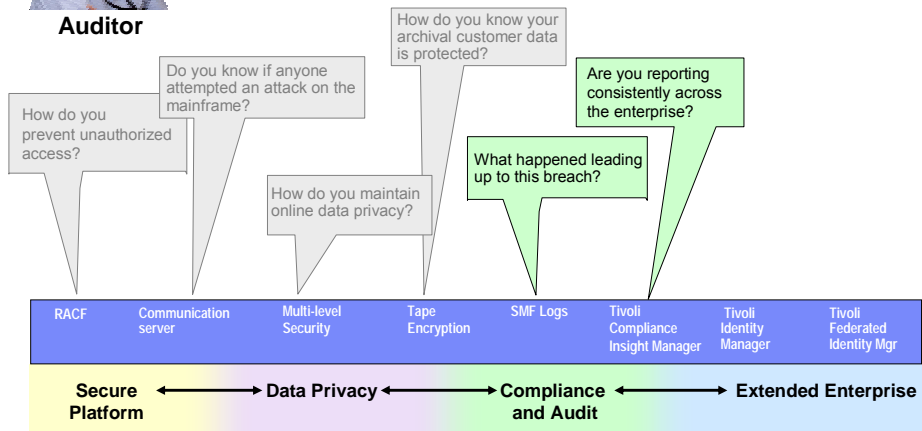
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Questions Auditors Might Ask



Auditor



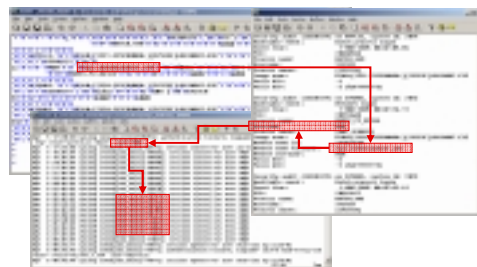
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The Foundation of Audit and Compliance is Comprehensive Logging

- System z SMF provides comprehensive logging across the sysplex
 - ▶ Consistent record formats help simplify compliance needs
 - ▶ Audit records report access to protected resources
- *Log continuity* from Tivoli zSecure Audit validates logs have been maintained
 - ▶ Uses the log system event records from multiple sources including System z
 - ▶ Examine activities of a specific user

With distributed systems, customers have to manually piece together logs



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Tivoli Compliance Insight Manager Strengthens the Compliance Process

- **Detects** security violations
- **Captures** security audit data from multiple systems
- **Correlates** data to identify audit risks
 - ▶ who, what, on what, where, when, from where, to where
- **Analysis engine** for deep analysis of collected data
 - ▶ Determine who was the last person to touch a particular file
- **Flexible reporting** related to specific compliance issues
- Checks for **log continuity** ensure that log collection is carried out

DEMO: Tivoli Compliance Insight Manager

Tivoli Compliance Insight Manager detected that our employee Michael, has been accessing restricted data.

How did this happen?



Service Oriented Finance
Security Officer



Other Tivoli zSecure Products Supports System z Auditing and Security Monitoring

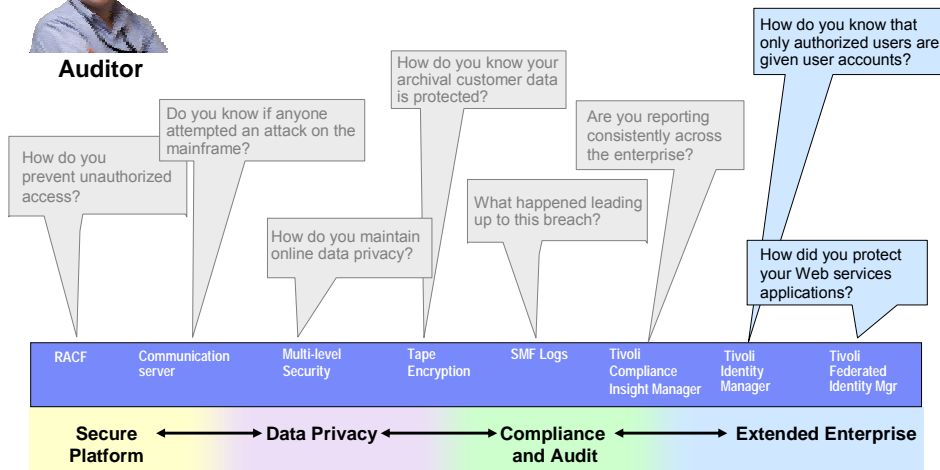
Tivoli zSecure tools interoperate to improve auditing and forensic capabilities

- **Tivoli zSecure Audit** is an audit and reporting tool for the mainframe environment
 - ▶ Built-in knowledge base identifies exposures
 - ▶ Provides real-time alerts based on policy exceptions
- **Tivoli zSecure Alert** provides real-time threat monitoring for z/OS and RACF
 - ▶ Can issue alerts when conditions occur
 - ▶ Can take action to stop security breaches
- **IBM Tivoli zSecure Command Verifier** prevents erroneous commands, thereby increasing control and decreasing the security risk and clean-up cost
 - ▶ Prevent non-compliant RACF commands from executing
 - ▶ Reduce security risks due to improper administration
- Flexible **CARLa** (Audit and Reporting Language) language for customized user reporting

Questions Auditors Might Ask

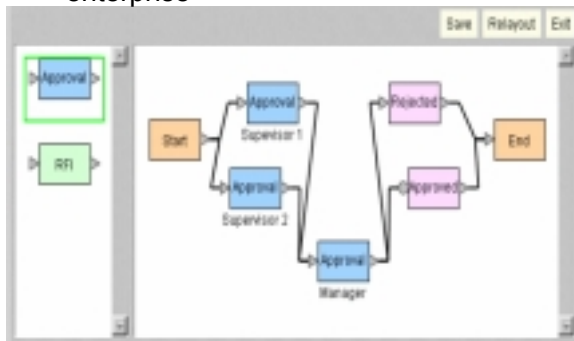


Auditor



Provision Users with Tivoli Identity Manager for z/OS

- 75-80% of help desk calls are for password reset or other trivial items
- Tivoli Identity Manager can eliminate this problem
- Provides self service password management
- Can provision and delete user accounts across your entire enterprise



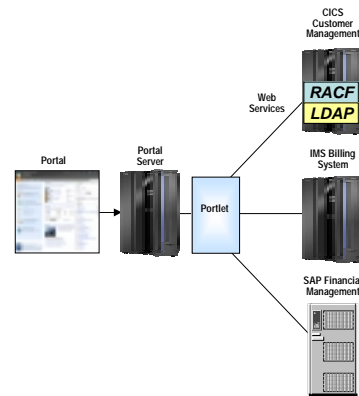
- Provides workflow for automating approval processes
- Searches for out-of-policy changes
- Provides email notification of changes

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Single Sign-on: Tivoli Federated Identity Manager

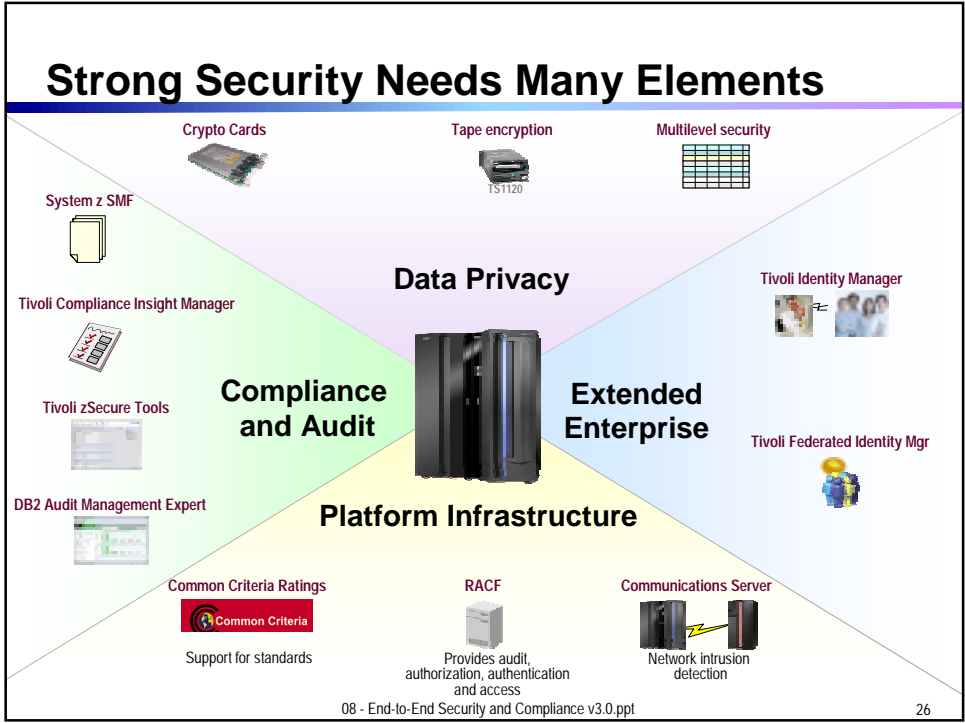
- Propagates the identity of the original requester in a **web services** environment
 - ▶ Provides single sign-on for web services
 - ▶ Maintains identity of the original user
 - ▶ Credentials can be propagated from the portal to RACF for end-to-end security
 - Uses Passtickets issued by RACF
 - ▶ Enable trusted transactions between business partners
 - ▶ Supports industry standards
 - SAML, Liberty, WS-Federation SSO



TFIM can provide single sign-on for the Service Oriented Finance Car Loan Solution


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Service Oriented Finance Requirements Met


So do you feel more secure?



IBM

My operations are now secure with System z

- Secure platform infrastructure!
- Data privacy!
- Compliance and audit!
- Security across the extended enterprise!



Service Oriented Finance CIO

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