Application Networking Services

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Agenda

- Where is the industry going?
- Why application services?
- What does cisco offer in the ANS Space?

Where the Industry is Going Today

Everything over IP

All Services Virtualized

Everything on Ethernet

All Devices Networked

What Does the above Mean?

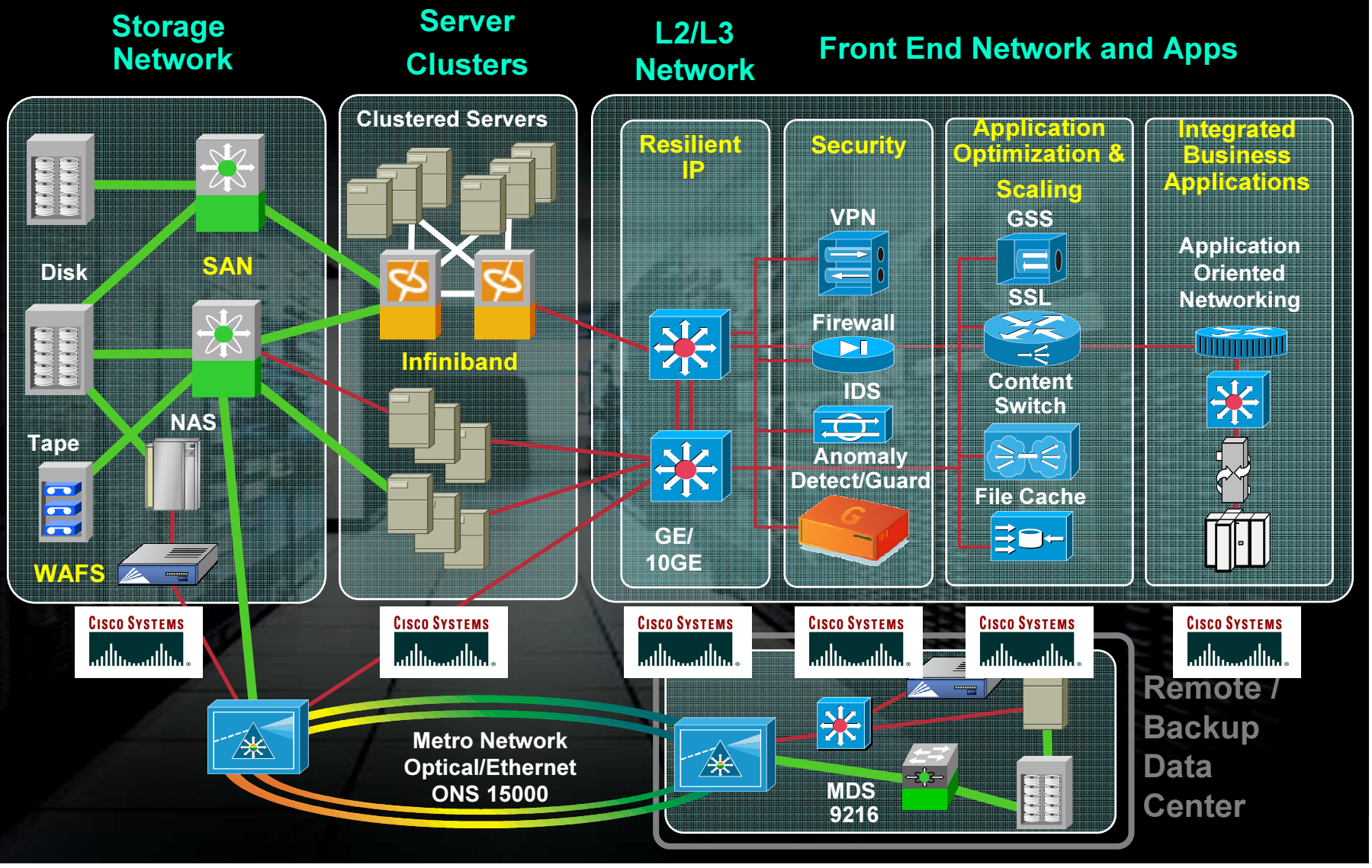
- The DC will substantially grow! And host ever more business critical services.
- Optimization becomes more relevant (standards are great but they're slower and introduce more overhead).
- Application Level Security becomes essential (75% of new attacks are against applications).
- Intelligent/Application Aware Routing & service/message gateways (Message Level Routing) become essential.
- Disparate Protocols & Applications (above layer 3/TCP) must integrate!
- Standard Transport, Message, & Business Protocols will become ever more important.
- Simple & Complex Transformation (on the fly) will play a bigger role. Most common transformation: Messages over multiple mediums.

Application Services: Pain Points

- Application Monitoring/SLA
- Application Optimization
- Application Mgt/Virtualization
- Application Security
- Application Scaling

Making the Network Application-Aware

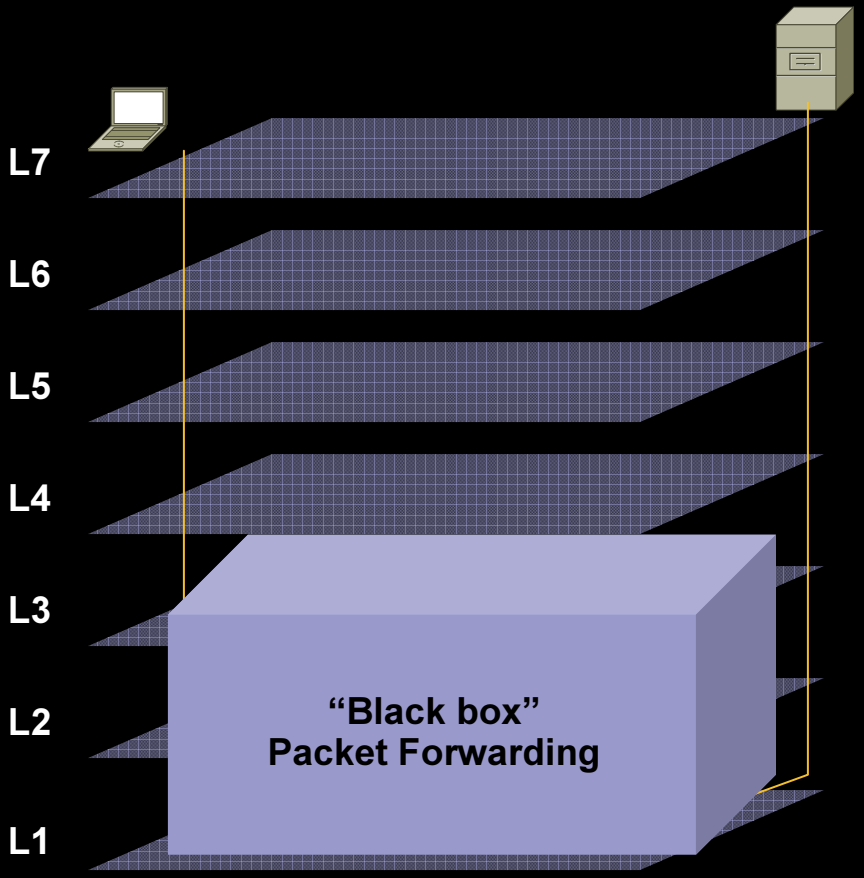
What Does Cisco Offer?



Network Paradigm Shift

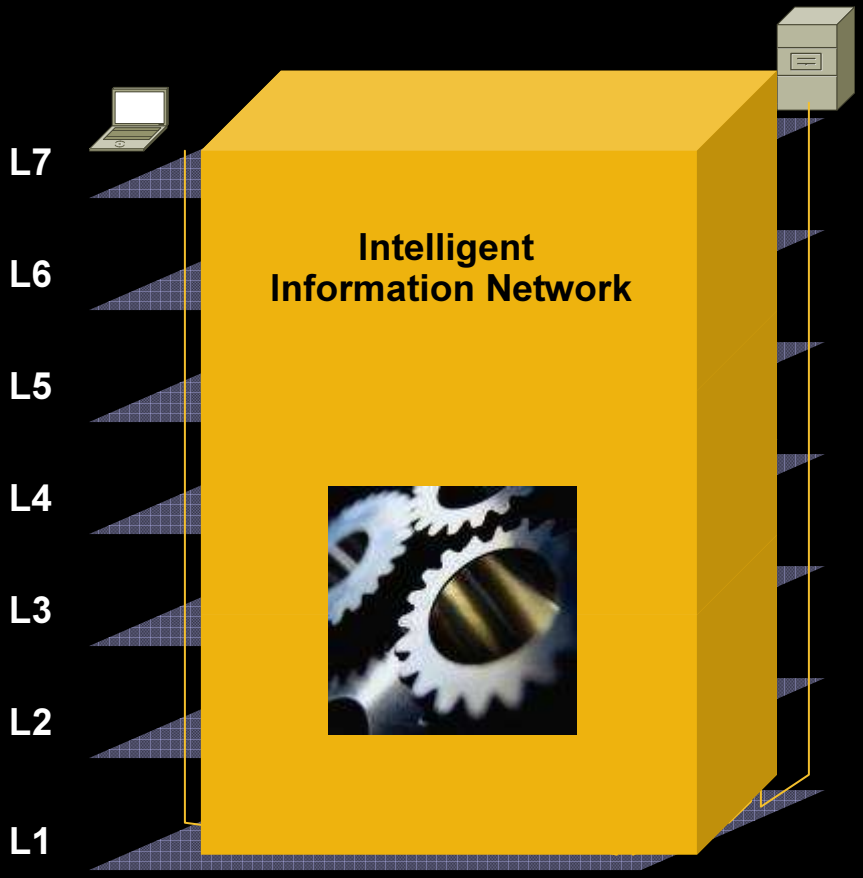
Old world

Network = packet forwarding



New world

Intelligent Information Network (IIN)
Service-Oriented Network Architecture (SONA)



Application Optimization

Why Optimization?

SampleServer;login;

19 characters!

However receiving application must know the following:
-Server Name = SampleServer
-Action = login
-Delimiter = ;
-EOL/EOF

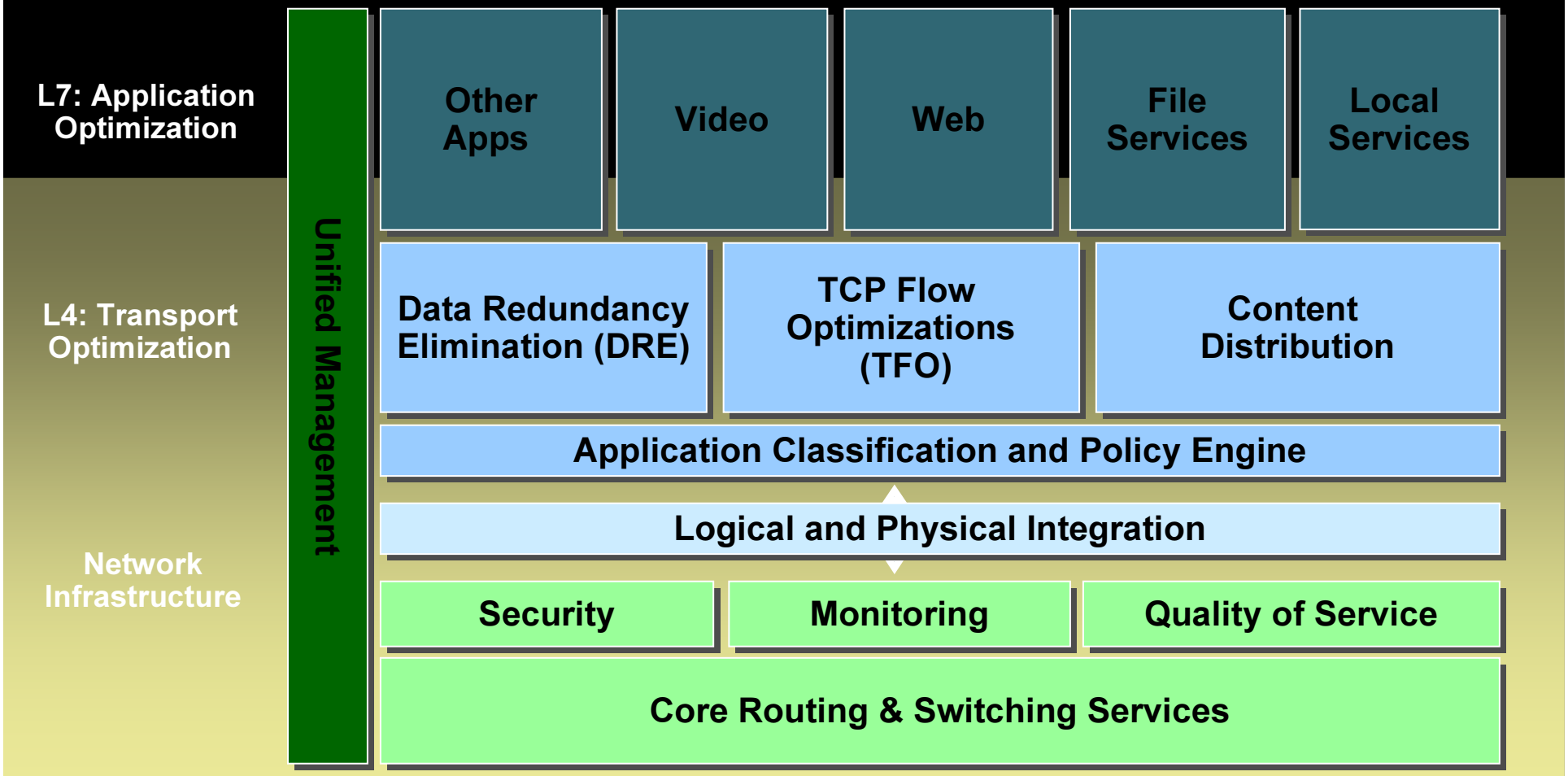
Why Optimization?

```
<?xml version="1.0" encoding="UTF-8" ?>
 <Request xmlns="urn:oasis:names:tc:xacml:1.0:context"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:oasis:names:tc:xacml:1.0:context cs-xacml-schema-context-01.xsd">
  <Subject />
 <Resource>
 <Attribute AttributeId="urn:oasis:names:tc:xacml:1.0:resource:resource-id"
DataType="http://www.w3.org/2001/XMLSchema#string">
  <AttributeValue>SampleServer</AttributeValue>
  </Attribute>
  </Resource>
 <Action>
 <Attribute AttributeId="ServerAction" DataType="http://www.w3.org/2001/XMLSchema#string">
  <AttributeValue>login</AttributeValue>
  </Attribute>
  </Action>
  </Request>
```

605 characters!

More Bandwidth! More Powerful Networking Gear! More need For Optimization! More Processing Power! More Storage!

Cisco WAAS Optimization Architecture



WAAS Accelerates Broad Range of Applications

Application	Protocol	Typical Improvement
File Sharing	• Windows (CIFS) • UNIX (NFS)	• 2X-100X
Email	• Exchange (MAPI) • SMTP/POP3, IMAP • Notes	• 2X-50X
Internet and Intranet	• HTTP, HTTPS, WebDAV	• 2X-50X
Data Transfer	• FTP	• 2X-50X
Software Distribution	• SMS • Altiris	• 2X-100X
Database Applications	• SQL • Oracle • Notes	• 2X-10X
Data Protection	• Backup Applications • Replication Applications	• 2X-10X
Other	• Any TCP-based Application	• 2X-10X

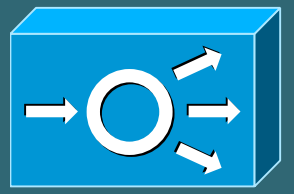
*** Performance improvement varies based on user workload, compressibility of data, and WAN characteristics and utilization. Actual numbers are case-specific and results may vary.**

Application Scaling & Virtualization

Why Scaling/Virtualization?

- Application instances periodically seize to work.
- Number of concurrent transactions/users may require many instances of the same applications
- Rules for load balancing applications have become more complex.
- Application/service virtualization has become essential in order to simplify & automated provisioning.

What Is ACE ?



Application Control Engine

Brand new product line in the Cisco ANS portfolio
Infrastructure simplicity in a single hardware platform,
ACE integrates

- Content switching
- SSL offload
- Data center security features

The first ACE product is a Cisco Catalyst® 6500 service module, which comes in three flavors: 4Gbps, 8Gbps,
and 16Gbps
The hardware supports two field-replaceable daughtercards for future hardware-accelerated application delivery functionality like HTTP compression
It delivers application infrastructure control, with features like virtual partitions and native role based access control (RBAC)

The Application Control Engine At-a-Glance

Application Infrastructure Control

- Virtual Partitioning
- Hierarchical Management Domains
- Role-Based Access Control

Application Performance

- High Throughput (16Gbps)
- Maximum Scalability (350K CPS)
- Multi-tiered reliability, availability, and scalability
- Server Load Balancing
- Content Switching (L7 decisions and advanced stickiness)

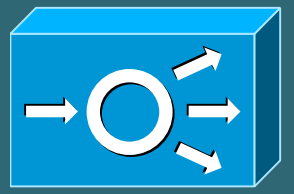
Application Security

- Protocol-layer inspection
- TCP/IP Normalization
- Hardware-accelerated Protocol Control
- Access Control List (ACL) (up to 256K ACEs)
- DDoS Protection

Infrastructure Simplification

- Layer 2–7 Network Integration
- Functional Consolidation
- Application Network Management solution
- TCP Offload
- SSL Termination
- XML API

ACE SLB Features



- Predictors: Round Robin, Weighted Round Robin, Least connections, IP Hash, Connection Watermarks, Content Awareness
- Health Probes: L3 Ping, L4 UDP Data, HTTP GET, HTTP HEAD, DNS, POP, IMAP, Telnet, ICMP, TCP, UDP, ECHO, Finger, SMTP, RADIUS, LDAP, HTTP GET over SSL
- TCP Reuse: TCP connections are reused to minimize TCP setup and teardown on real (application) servers
- HTTP Redirection
- Persistence: Cookie, Cookie Insert, Offset & Length, Header Insert
- Redundancy: Inter-chassis (ACE modules in different Catalyst 6500), Intra-chassis (ACE modules in the same Catalyst 6500), or Inter-context (virtual partition) between applications. A mix of multiple active and standby contexts may run on a given ACE module

Application Acceleration & Security

Web Application Acceleration

- **Optimize at Layer-7**
  - 2X–response time improvements
  - 80% decrease in bandwidth requirements
  - 80% fewer server cycles
- **Stop application hacking**
  - Safely deploy applications
  - Secure mission critical data
  - Streamline operations

Secure, Fast & Reliable Applications

Cisco AVS 3120

Huge Lead in Acceleration Features

Functional Areas	AVS Acceleration Features
Latency Reduction	▪FlashForwarding* ▪Browser TCP multiplexing* ▪PDF download optimization ▪Response redirection control*
Bandwidth Reduction	▪ GZIP Compression ▪ Delta encoding* ▪ Dynamic browser caching* ▪ Dynamic image optimization ▪ Flexible processing rules
Server Offload	▪ TCP Offload ▪ SSL Offload ▪ RAM Caching ▪ Dynamic caching* ▪ Load-based caching* ▪ Lazy request evaluation* ▪ Single sign-on optimizations ▪ XML merging/transformation

Delta Encoding

- Web page caching is successful because many Web pages don't change and subsequent requests may be satisfied from the cache instead of the server.
- But some resources and content often change, which forces the re-retrieval of the modified page.

  Page will be marked as Non Cacheable
- However, the modifications and changes are often minimal.

  Often only a few bytes
- Delta encoding delivers to the client only the *differences* between the cached (older) page and the new page.

  Often only a few bytes

Why Application security?

75% of Attacks Focused Here

Custom Web Applications

Custom Desktop Apps

Business Logic & Code

No Signatures or Patches

Web Servers	Application Servers	Database Servers
Operating Systems	Operating Systems	Operating Systems

Network

Network Firewall

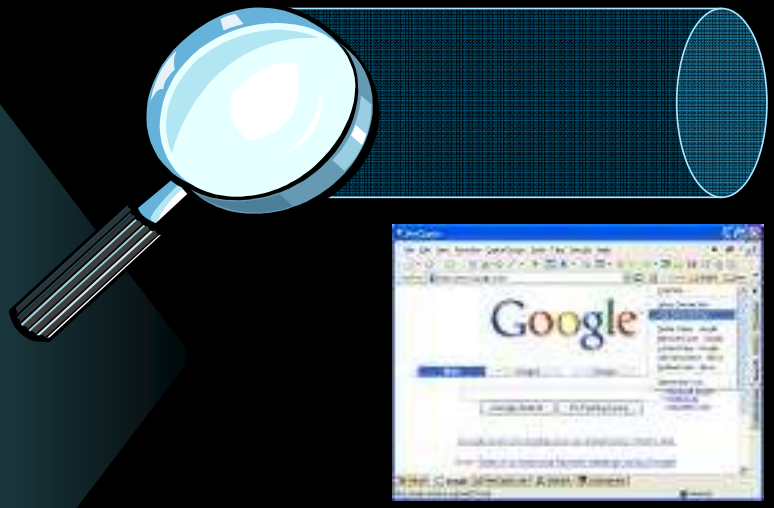
IDS IPS

Comprehensive Application Security is the Answer!

AVS Delivers Applications Securely

INSPECTS FOR:

SQL Injection
Cross-Site Scripting
Command Injection
Cookie/Session Poisoning
Application Reconnaissance
LDAP Injection
Buffer Overflows
Directory Traversals
Attack Obfuscation
Application Platform Exploits
Zero Day Attacks
Cookie Poisoning
Parameter Tampering



- Bi – Directional Deep Inspection
- Positive & Negative Security
- Protocol compliance and anomaly detection
- Transaction logging and report for application security forensics

Application Monitoring & Management

Why Application/Activity Management?

- Distributed Applications are more difficult to manage.
- Policies enforced across applications are too costly.
- Distributed attacks have become far more common.

Cisco AON Core Capabilities

Intelligent Messaging

- Reliable messaging
- Content based routing
- Transformation
- Protocol switching
- Message distribution
- Message load balance

Application-level Policies

- Authentication
- Authorization
- Encryption/Decryption
- Data integrity/ non-repudiation
- Digital signatures
- Centralized PKI mgt.

Business Event Visibility

- Event capture, filtering
- Logging for audit
- Automatic notification
- Policy controlled
- Feed to dashboards
- Link to Network events

Application Optimization

- Hardware Acceleration (SSL, Crypto, XML)
- Message level Caching and Compression
- High Availability, Failover, Load Balancing

Extensibility

- ADK (for custom adapters)
- SDK (for custom bladelets)
- AON Technology Partners

Application Networking Services! Where?

- **If you have applications running!! You may need one or more ANS technologies.**
- **If you have branches!! You may need WAN Optimization**
- **If you have multiple or mission critical applications, you may need Content Switching & Load Balancing.**
- **If you're looking to improve application performance then you should consider SSL offloading, TCP offload, etc…**
- **If you have wireless! you may need RFID--Tracking.**
- **If you have network security, you may need Application-Level Security.**

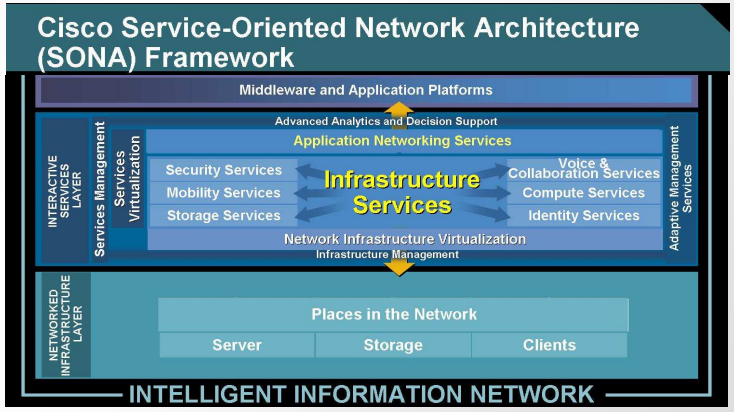
Questions!

SONA/SAP Business Cases

- Enable continuous monitoring and periodic testing of customer's Network IT Security environment in order to detect changes that may compromise IT Security compliance.
- Enable & Enforce Service Level Agreements (SLA) compliance.
- Enable non-intrusive protection of sensitive—personal & financial data exchanged across the network.

SONA GRC Solution Overview

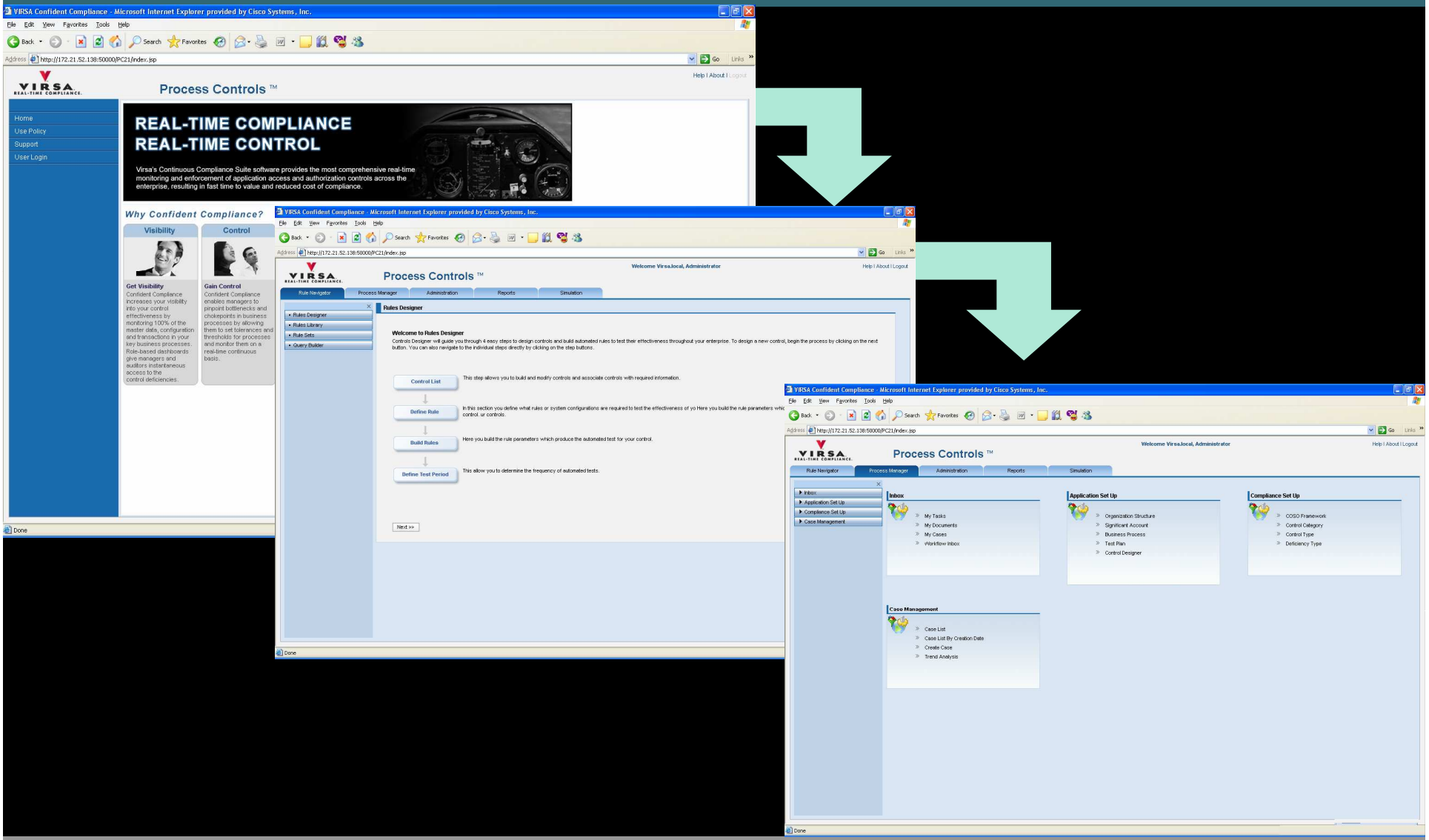
Cisco/SAP Adapter Layer



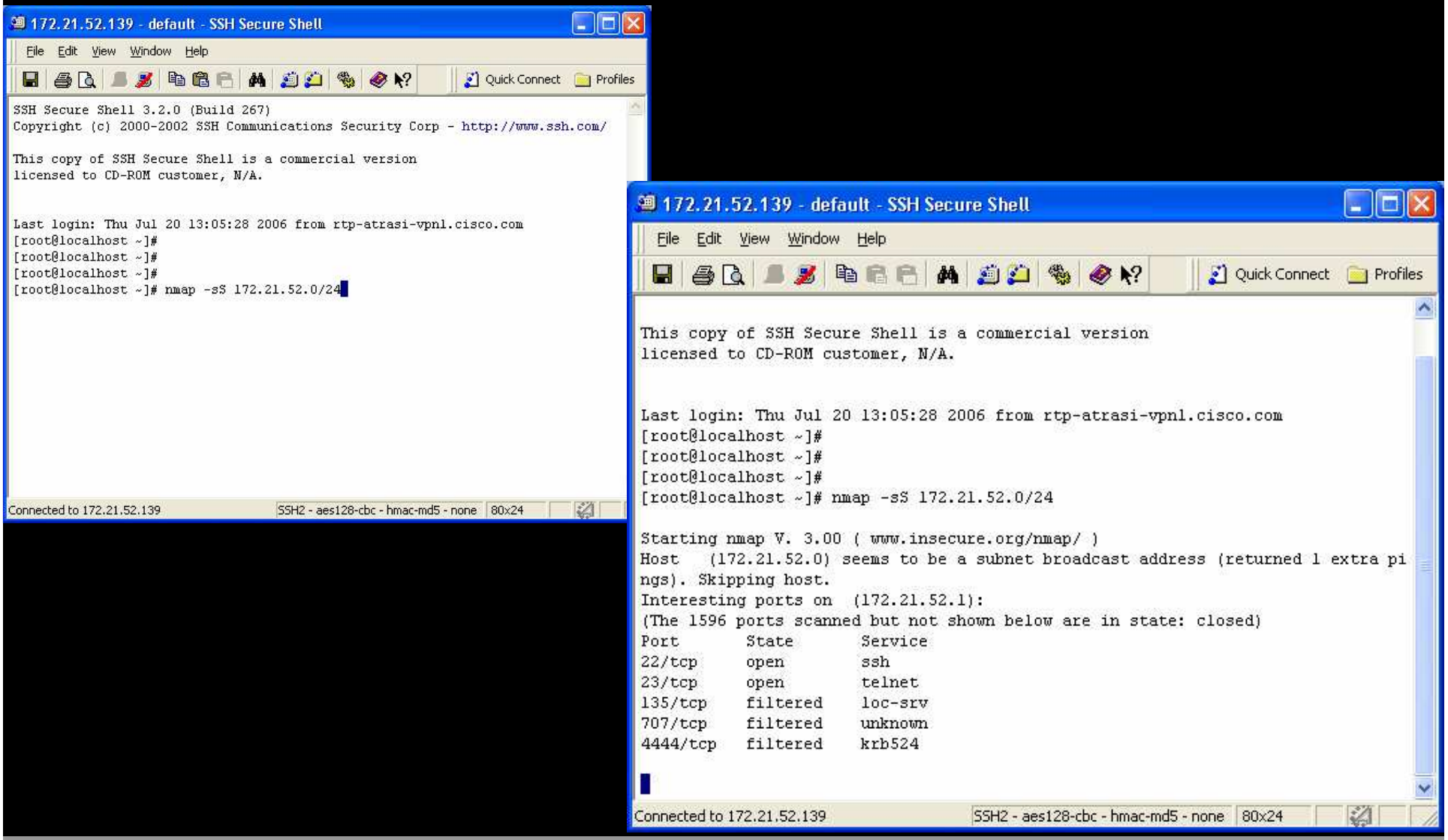
- **Network-embedded GRC increases transparency and ability to manage risk effectively**
- **Shift to automatic controlled testing & simulations**
- **Aggregates and correlates multi-system, multi-application and multi-source information**
- **Provides predictive or early warning notifications**
- **Aligns controls with industry standards (e.g. COBIT)**
- **Delivers executive visibility into critical operational controls**

Sample SONA/GRC Business Case

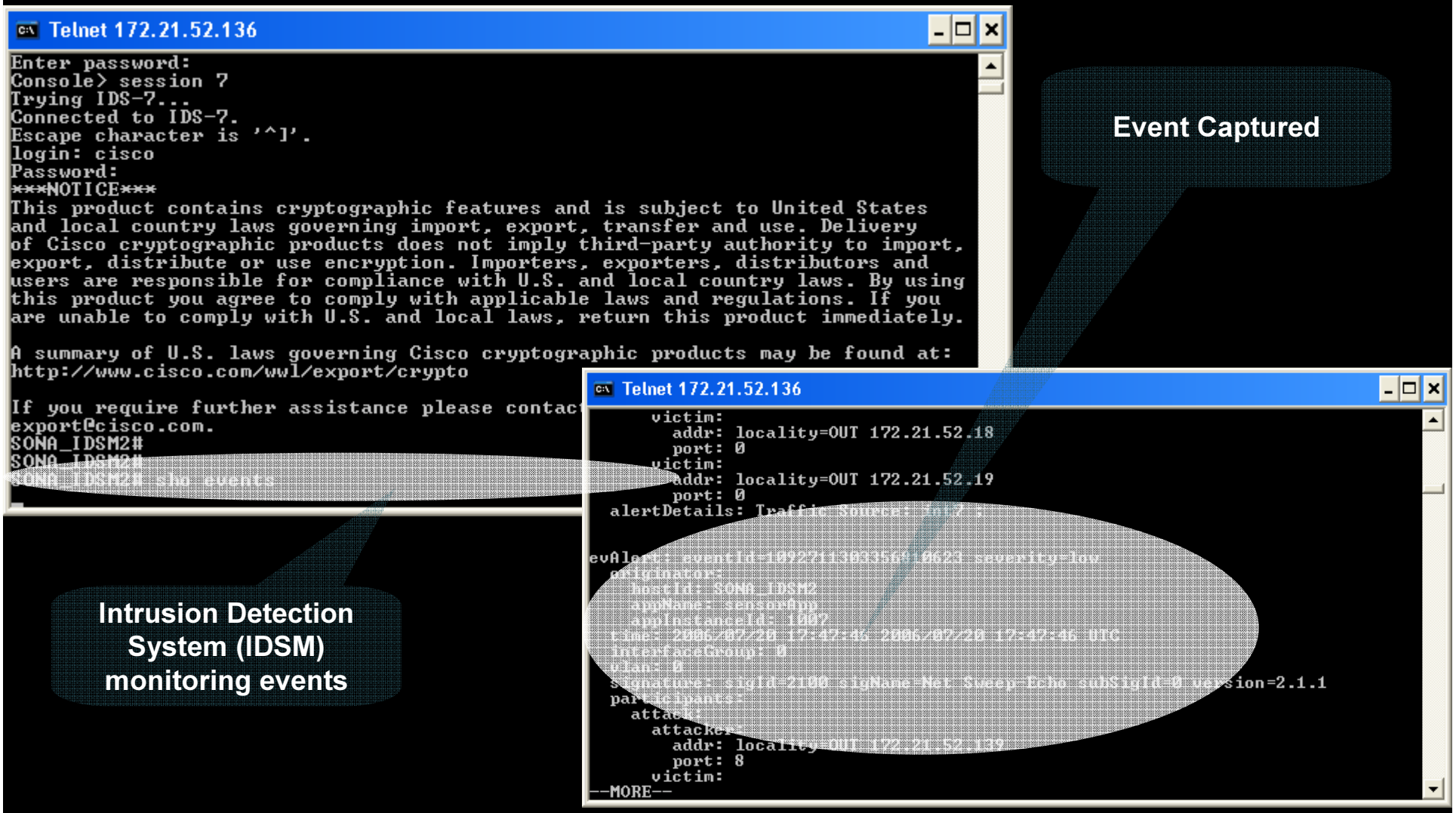
SAP GRC – Configuration Screens



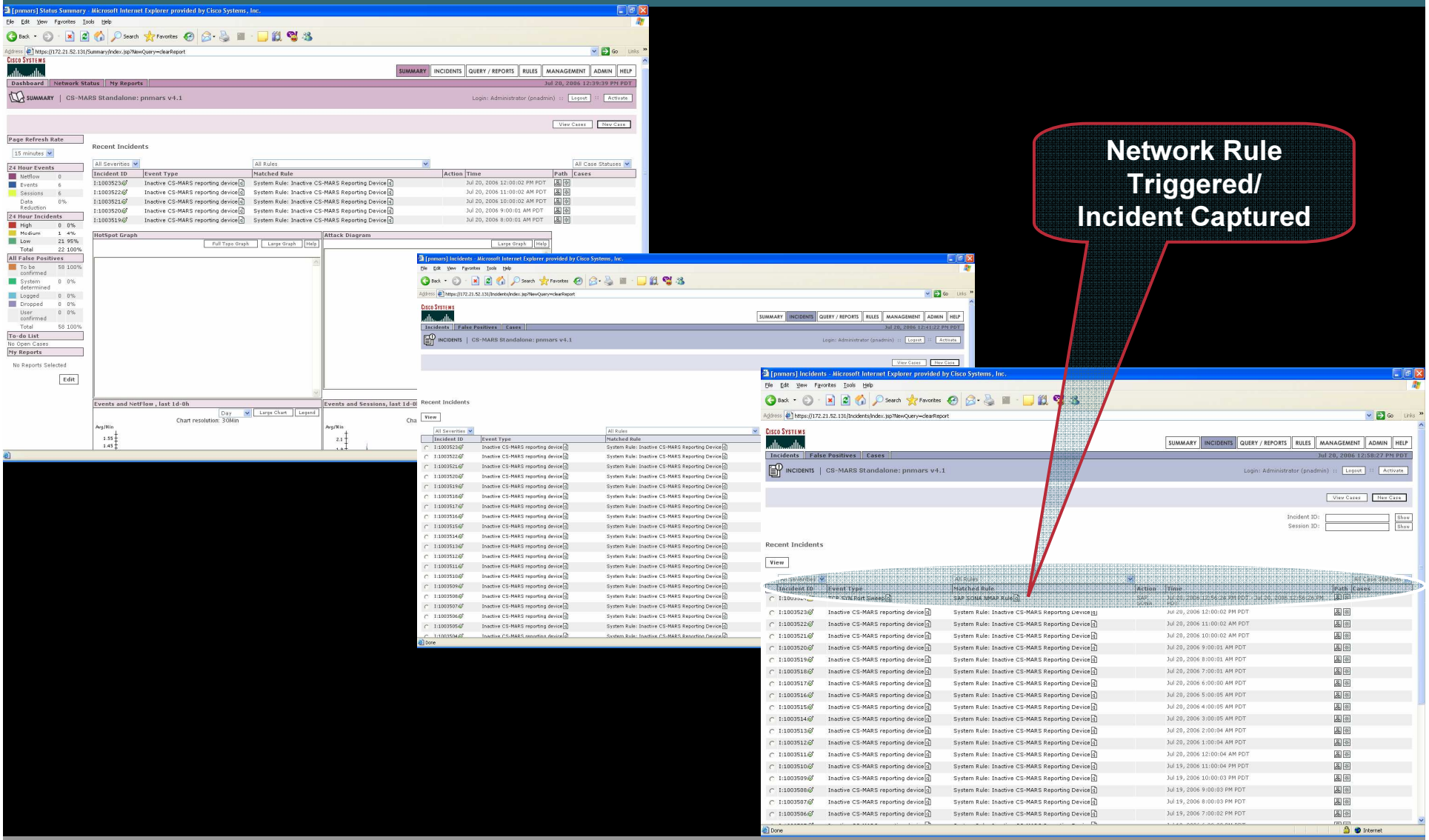
Network Event – Port Scanning



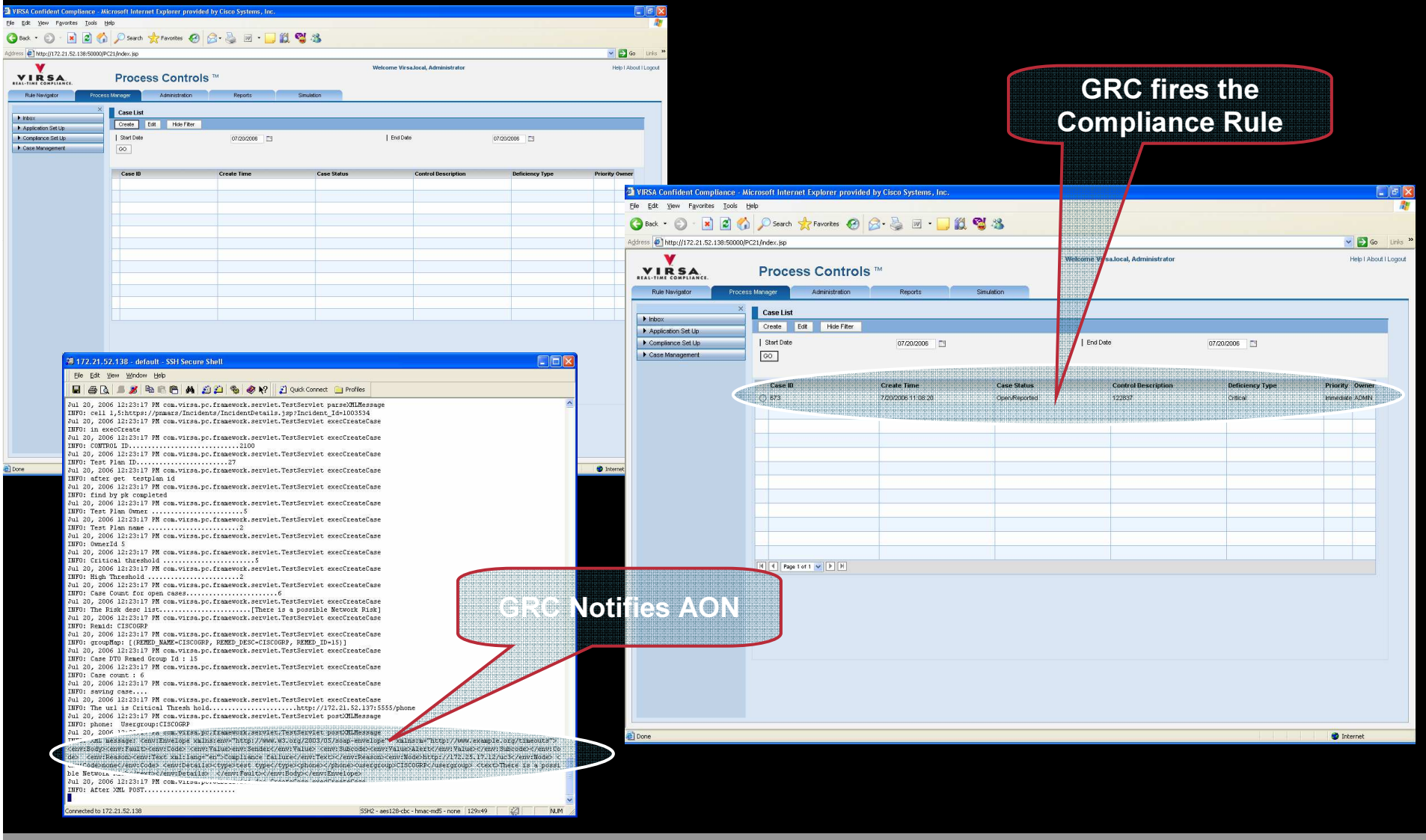
SONA Device (IDSM Module) Captures Event



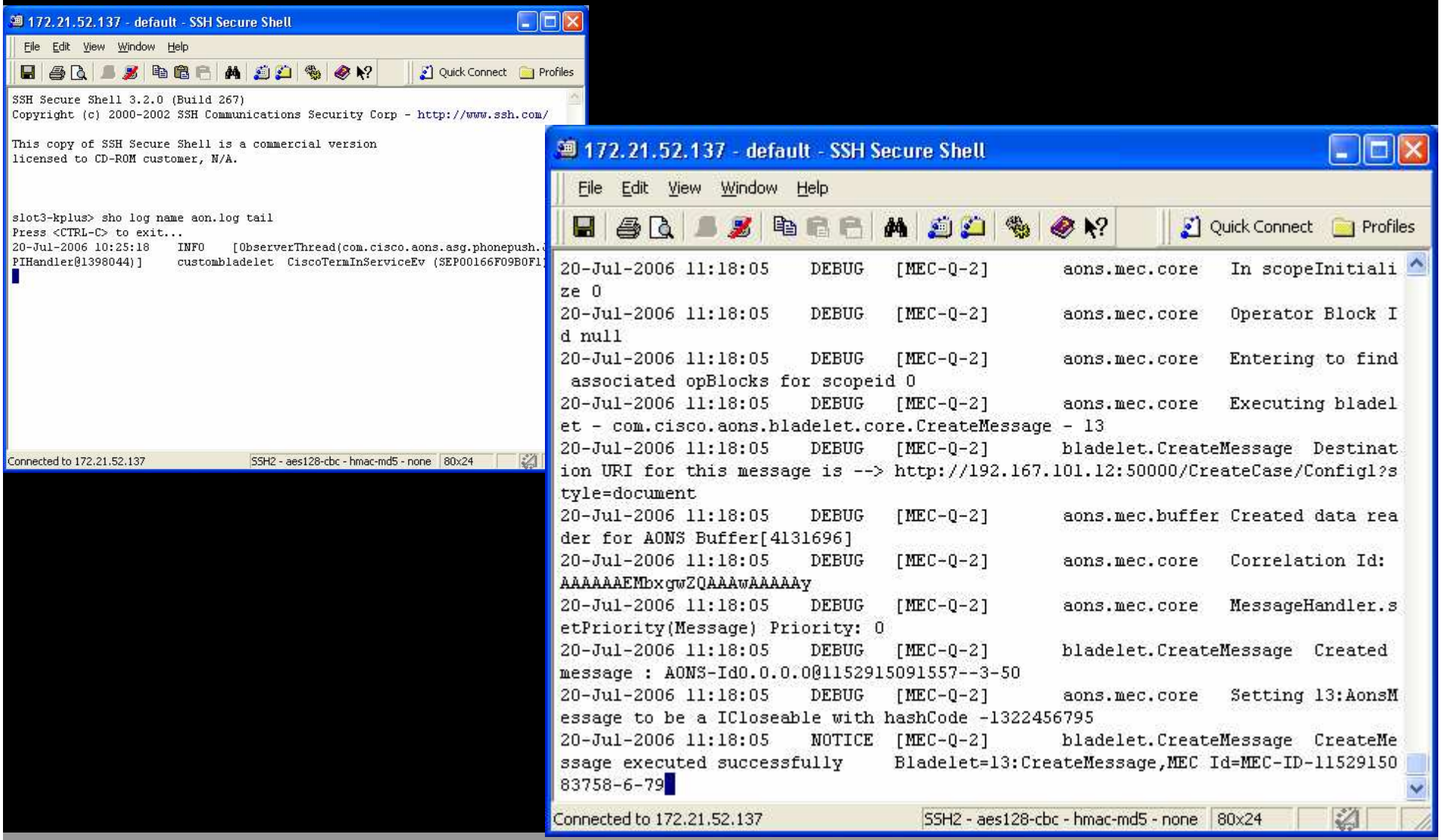
SONA Device (CS MARS) Captures Event



SAP GRC is Notified through SONA Device (AON)



SONA Device (AON) Sends Notification over Unified Messaging to IP Phone



SONA Device (IP Phone) Displays Event

Compliance Breach Notification is Displayed

Other Technology Solutions

- Location Tracking.
- Unified Communication-CRM Integration.
- FIX Monitoring.