Locking Up Your Storage Network

(Securing the SAN Infrastructure)

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BROCADE
The intelligent platform for networking storage

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Why Secure SANs?

- Security is a fundamental requirement for enterprise SANs, just like any other network
- As SANs increase in size and are inter-networked over MAN/WANs, physical monitoring and management is no longer feasible or cost-effective
- Multi-tenant environments have new security requirements
  - Security enables sharing of SAN resources among multiple customers securely
  - Reduces xSP infrastructure costs and enables economies of scale

SAN Security Requirements

- New levels of access control
- Strong authentication
- More controls in SAN Fabric Management
- Confidentiality (data privacy)

New Levels of Access Control

- SAN fabrics require more controls to prevent unauthorized access:
  - To a switched fabric to gain access to sensitive information such as zoning data, security policies etc.
  - To SAN fabric switches (using a laptop) through unprotected connections (serial ports etc.)
  - Through the front panel of fabric switches and other SAN infrastructure devices
- SAN fabrics require more granularity in management access controls
  - Multiple user/administrator roles

Strong Authentication

- Without authentication, SANs are susceptible to:
  - Spoofing: Hosts (servers) sign on with phony WWNs and get access to devices they shouldn't
  - Denial of service attack: unauthorized host application sends out a high volume of dummy management messages or I/Os to a LUN it doesn't own
  - Rogue devices could be added to the fabric

More Controls in SAN Fabric Management

- The need for controlling how a SAN fabric is managed
  - Ability to turn on or off certain management access to the fabric
  - Control of end points accessing management facilities within the fabric
  - Secure remote management access
  - Centralization of configuration (security) parameters – secure distribution of critical management data

Confidentiality

- Encryption is required to eliminate eavesdropping threats:
  - Cleartext passwords and other data
  - Secure Remote Access – Encrypted management data
  - Unauthorized analysis on the Fibre Channel line or other interfaces to analyze management or data traffic (e.g., Sniffers)

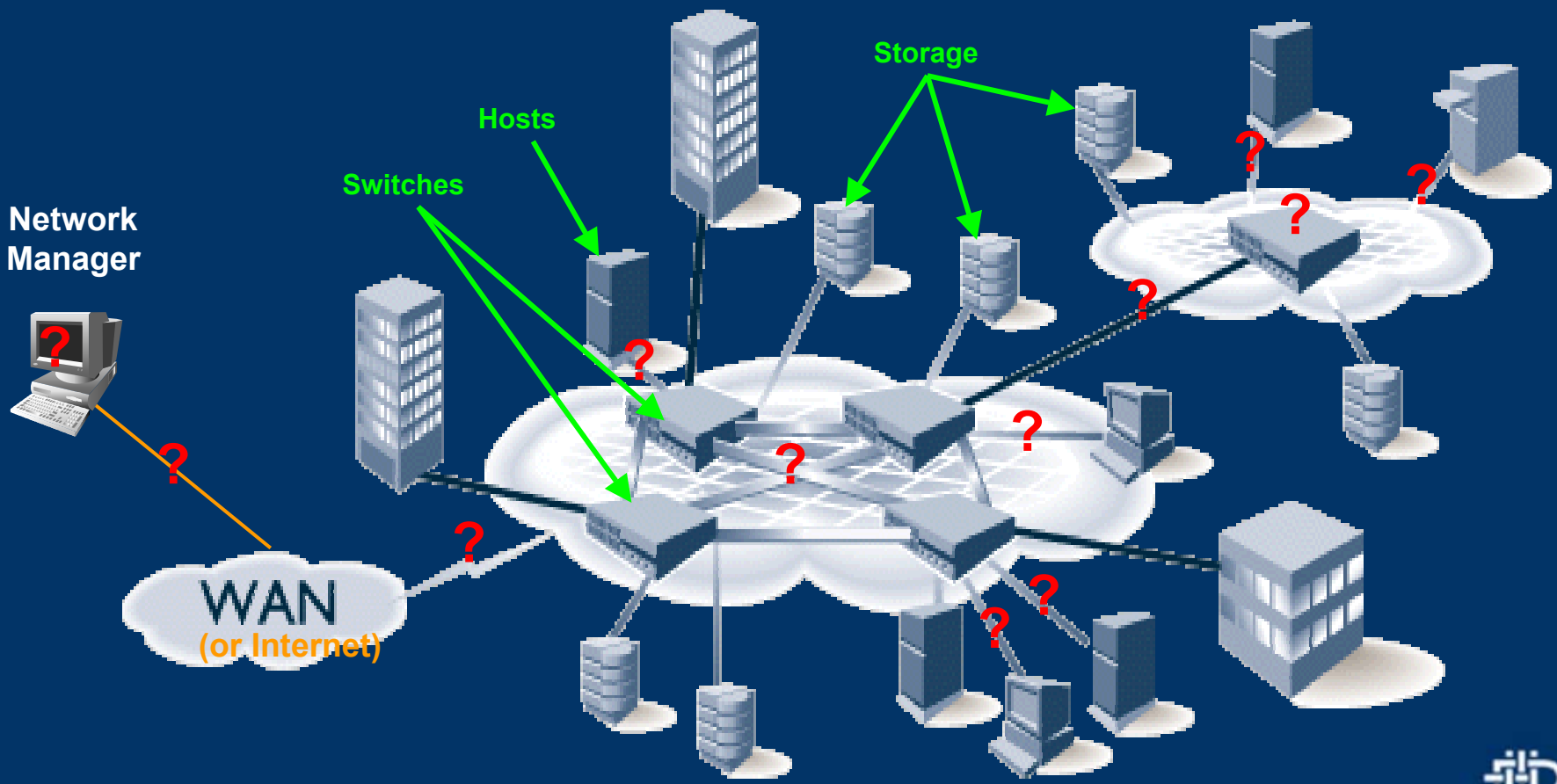
SAN Security – An Infrastructure Decision

- Security is a fundamental consideration when designing SANs and selecting SAN infrastructure

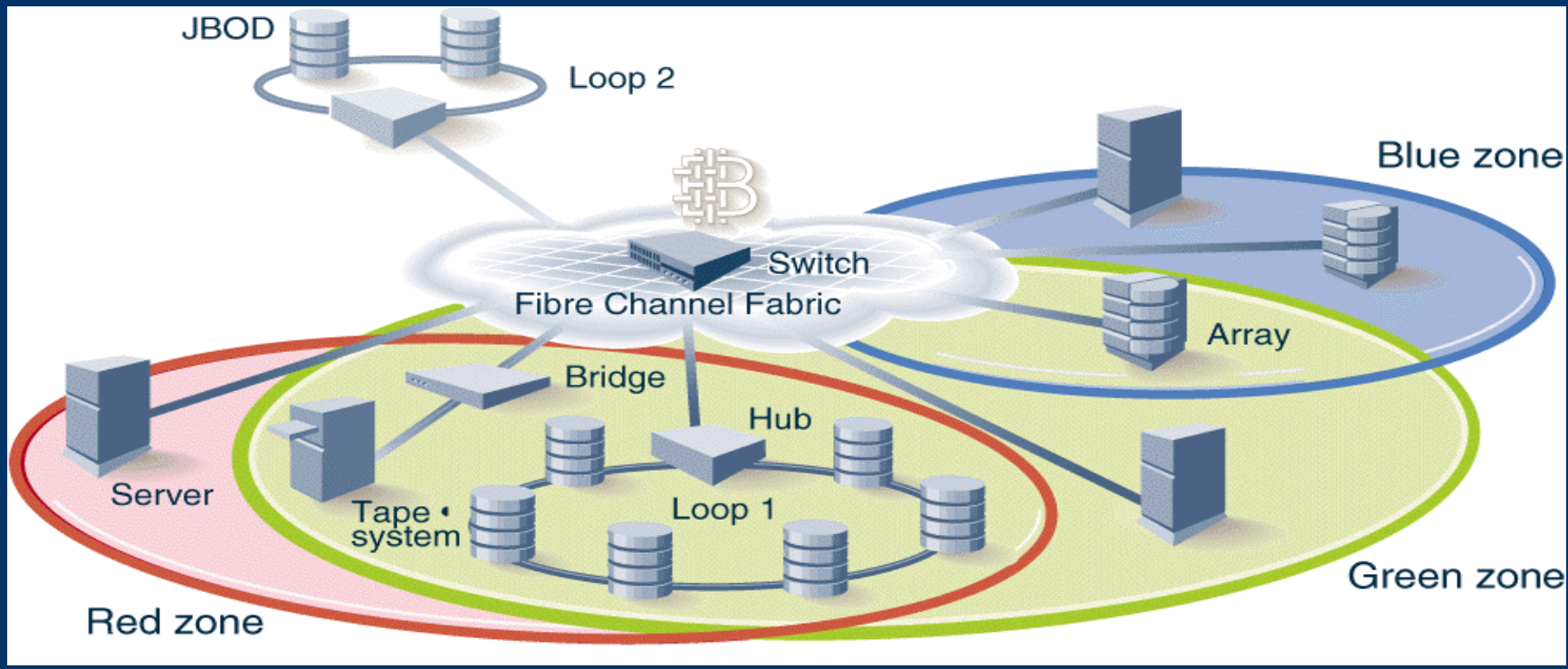
- As with any network, SAN security must be:
  - Robust
  - Scalable
  - Policy-based
  - Based on proven, standards-based mechanisms
  - Manageable
  - Auditable

SAN Fabric Security Vulnerabilities

? = Potential Security Control Points



Zoning: Association of Storage with Servers (Today)

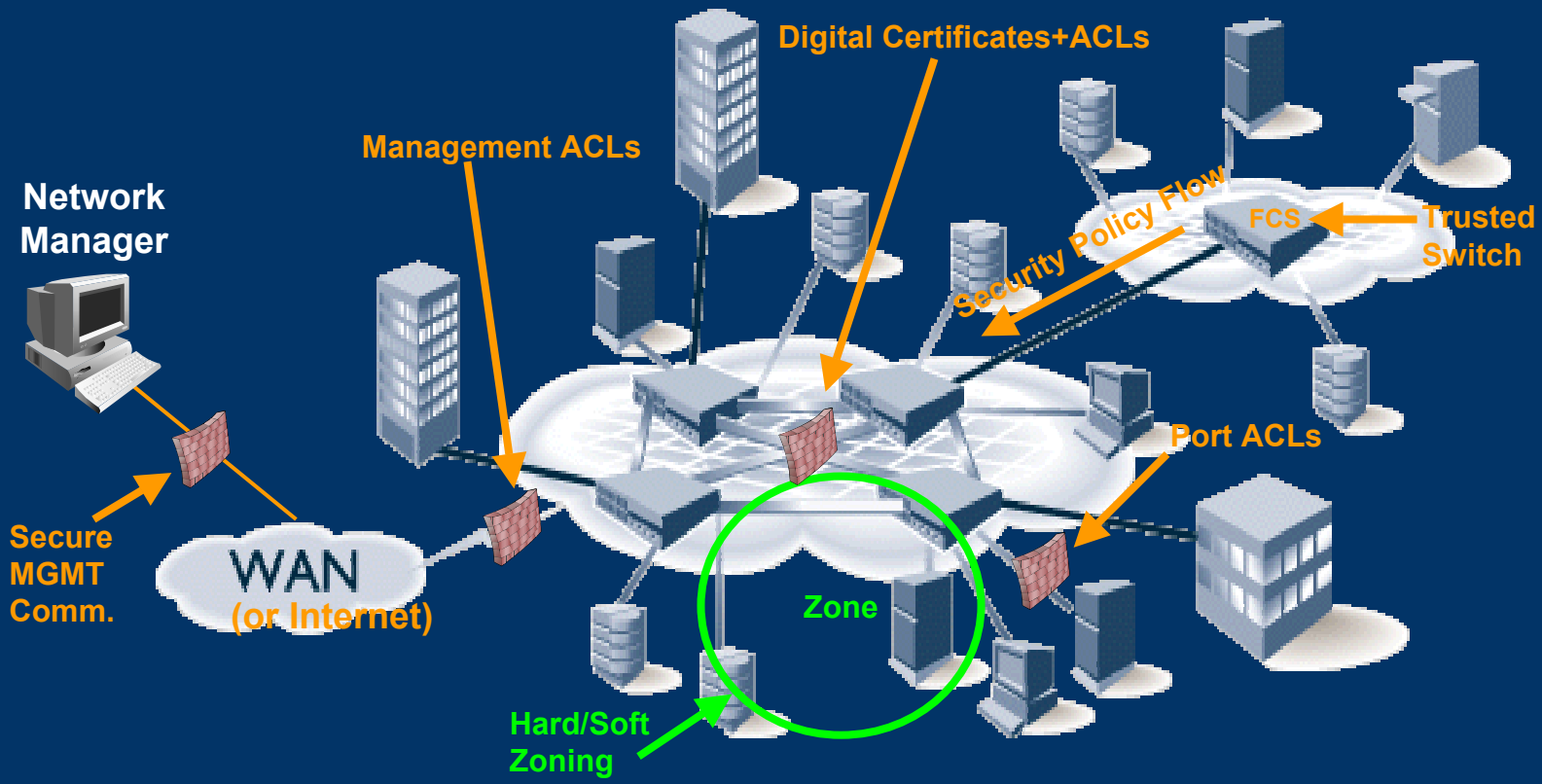


- Zoning: Logical association of storage with servers
  - Used for access control (I.e. No zone sees Loop 2)
  - Must be hardware enforced

Fabric Security Controls

MAC = Management Access Controls
ACL = Access Control List
ISL = Inter Switch Link

A Secure SAN Infrastructure



Security Threats and Best-in-Class Solutions

Threat/Risk	*Best-In-Class Solutions*
Unauthorized/ Unauthenticated User Access	- Multilevel password control and encryption - Strong authentication – Integrate with customer's existing RADIUS / TACACS+ / other infrastructure
Insecure Management Access	- Management access control policies - Encrypt mgmt. information (user name/password) where applicable Other Solutions : SSL, SSH, IPSEC
Spoofing of Device Names (WWNs)	- More granular access control for hosts/servers (at port level) - Strong in-band authentication of SAN fabric logon attempts
Management Controls From Uncontrolled Access Points	- Asymmetric management approach-Trusted switches to set security controls - Use of strong authentication (PKI)

For More Information

- Please access the Secure Fabric OS white paper and datasheet at:
  - http://www.brocade.com/SAN/white_papers.jhtml
  - http://www.brocade.com/SAN/data_sheets.jhtml
- Other Educational Tools
  - Brocade SAN Security Course (2 days)
  - SAN Security - A Best Practice's Guide
- Contact your Brocade Partner or Sales Executive
- E-mail: info@brocade.com

Thank You

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