I Touch the Future,

I Teach.

Crista McAuliffe

Computer Security

A Program for Federal Government *Functional Managers*

Computer Security Is Everyone's Responsibility

Cooperation and support from all personnel is an essential key to a successful program

End User Supervisor

FACT 1

COMPUTERS ARE CRITICAL TO FULFILL YOUR AGENCY MISSION!

FACT 2

THERE ARE DEFINED THREATS TO YOUR COMPUTER SYSTEM!

FACT 3

COMPUTER SYSTEMS ARE VULNERABLE!

FACT 4

COMPUTER SECURITY IS ESSENTIAL TO PROTECT YOUR SENSITIVE AND CLASSIFIED INFORMATION!

FACT 5

COMPUTER SECURITY AWARENESS AND TRAINING PROGRAMS REDUCE RISK!

Management Responsibility

Set Standards

Assure User Training

Develop Policies & Procedures

Provide Knowledge/Enforce Regulations

Provide Assistance

Supervise

Set the Example

FIRST LINE SUPERVISOR'S RESPONSIBILITIES

Set a personal example while carrying out computer security policies and procedures.

Provide computer security orientation/awareness to employees.

Provide input to the AIS Security Plan.

Review audit logs periodically.

Provide password management and system access control for employees.

Identify mission critical AISs/networks.

Report security violations and incidents.

Support and promote good security practices.

Definitions

- INFOSEC
- COMSEC
- COMPUSEC

INFOSEC Concerns

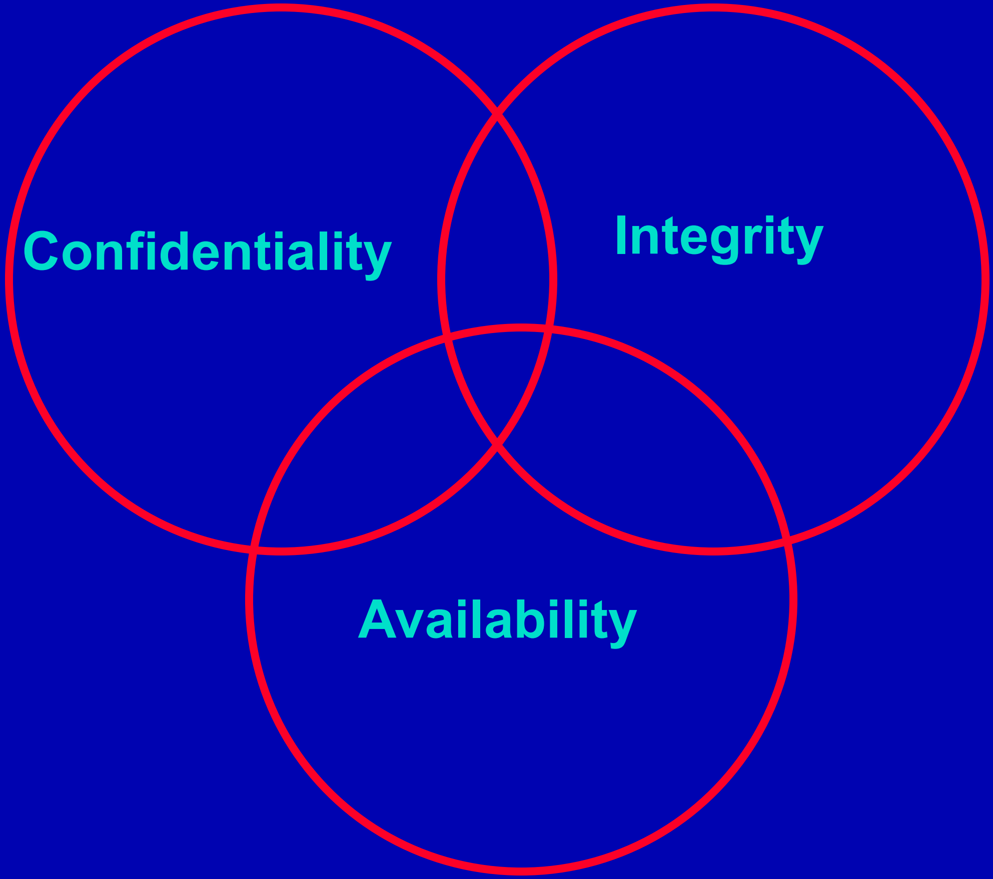
- Compromise
- Integrity
- Denial of Service

More Definitions

- Sensitive Information
- Confidentiality
- Integrity
- Availability
- States of Information:
  - Store
  - Process
  - Transmit

Current Issues

Confidentiality, Integrity, Availability



Confidentiality

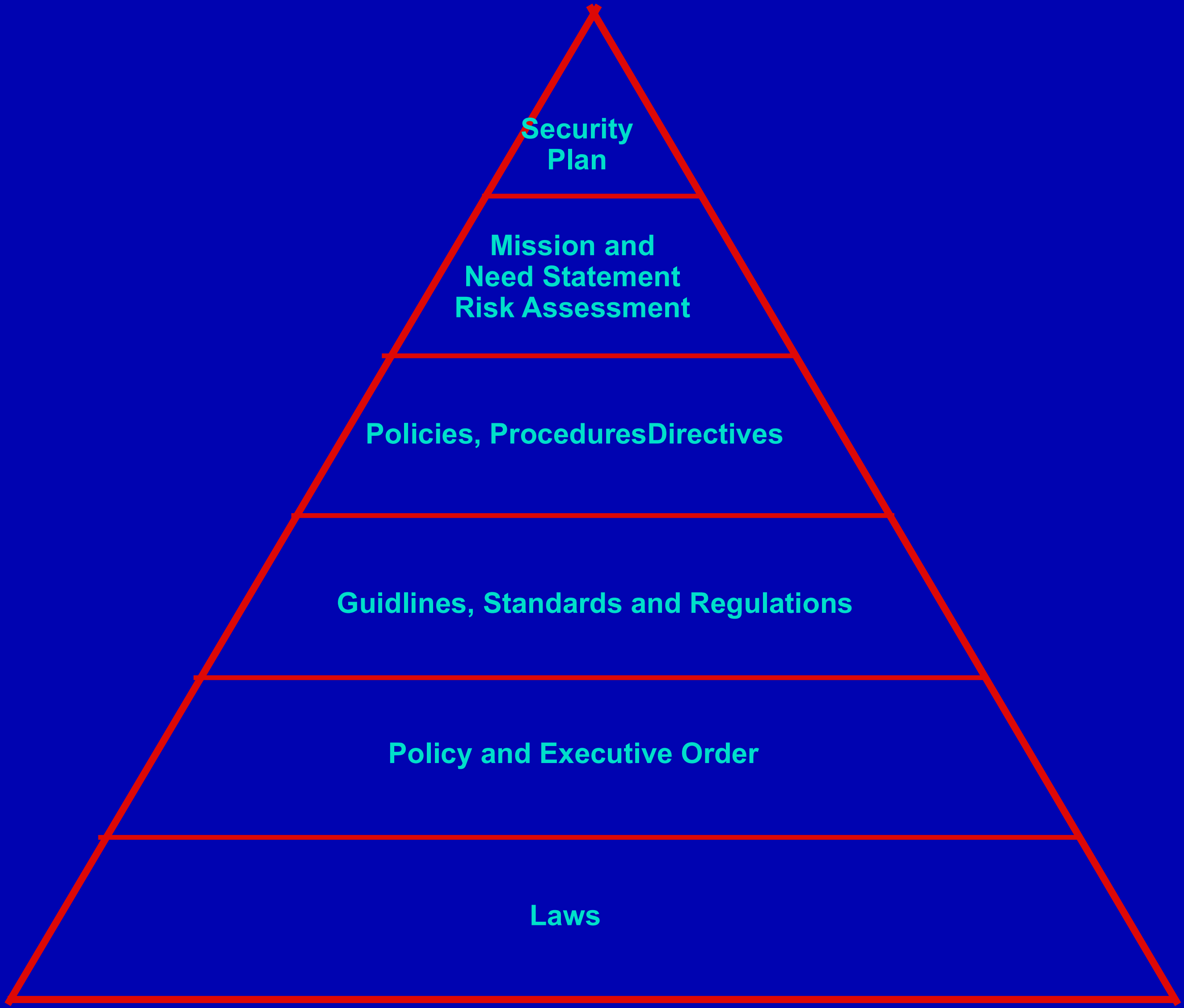
Integrity

Availability

Organizational Impact

- Compromise of Data
- Loss of Confidence in System
- Loss of Money
- Loss of Time
- Repair or Replacement of Equipment

Policy Pyramid



Security
Plan

Mission and
Need Statement
Risk Assessment

Policies, ProceduresDirectives

Guidlines, Standards and Regulations

Policy and Executive Order

Laws

Applicable Computer Security Statutes

Public Law 97-255

Federal Managers Financial Integrity Act of 1987

Public Law 98-473

Comprehensive Crime Control Act of 1984

Public Law 99-474

Computer Fraud and Abuse Act

Public Law 99-508

Interception or Disclosure of Wire, Oral or electronic Communications

Public Law 100-235

Computer Security Act of 1987

Public Law 100-503

Computer Matching and Privacy Protection Act

Applicable Policy and Executive Orders

OMB Circular A-130
Management of Federal Information Resources

OMB Circular A-123 & 127
Internal Control/Financial Management Systems

OMB Bulletin 89-22
Computer Matching and Privacy

OMB Bulletin 90-08
Agency Security Plans

Executive Order 12333
United States Intelligence Activities

Executive Order 12356
National Security Information

DCI Directive 1/16
Security Policy for Uniform Protection of
Intelligence Processed in AIS's and Networks

Guidelines, Standards and Regulations

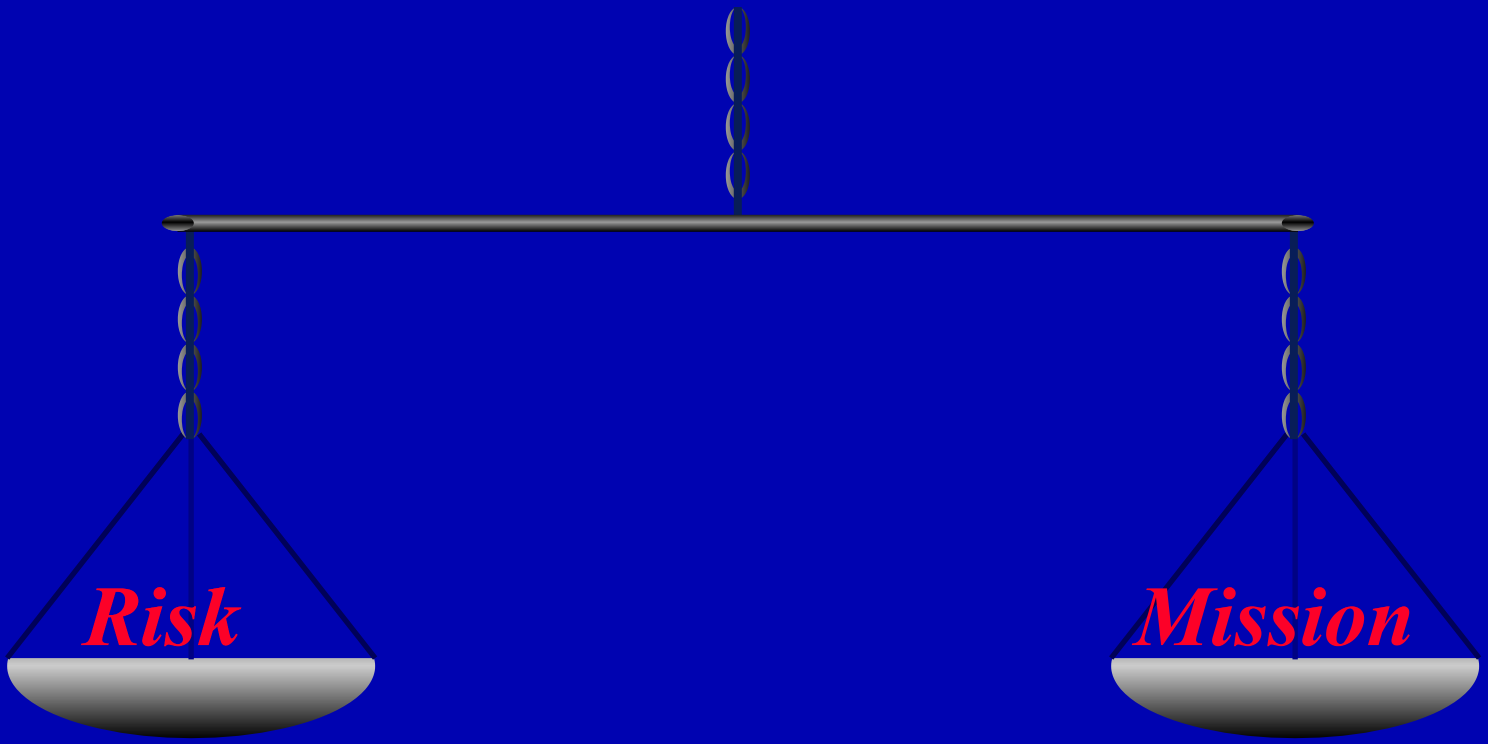
- National Institute of Standards and Technology (NIST)
  Technical Publications, Training Assistance and Newsletter
- National Computer Security Center (NCSC)
  Rainbow Series, Technical Reports
- Office of Personnel Management (OPM)
  Training Requirements for all USG Employees
- Government Accounting Office (GAO)
  Reports on AIS Deficiencies and Remedies
- General Services Administration (GSA)
  Provides Training Services for Users

Agency and System Documentation

- Policies, Procedures, Guidelines and/or Directives
  - Obtain These From Your Federal Agency
  - These are Agency-wide Computer Documents
  - They Will be Specific to Your Organization

Risk Management

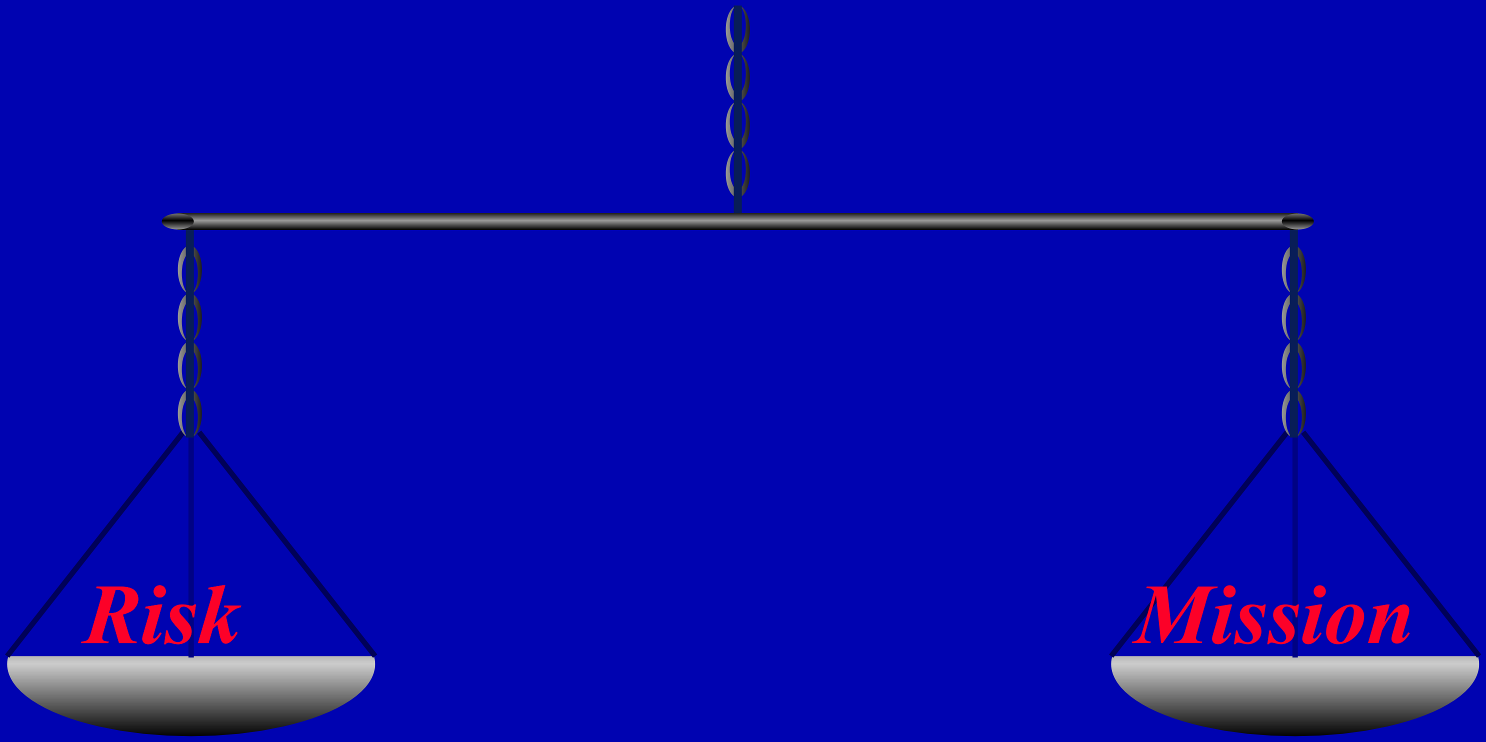
INFOSEC IS BASED ON RISK
“You Cannot Protect Everything From Everybody all of the time



Risk = Threat X *Vulnerability — Security*

Computer Security

The Key Question
"How Much"



The Balancing Act

Risk Management

Risk Management is:

- A systematic method to analyze security risks and bring in cost effective safeguards to reduce risk
- Cost-benefit: Have to "sell" it to management
- Risk Management in simpler terms:
  - 1. Decide what you need to protect.
  - 2. Decide what you need to protect it from.
  - 3. Decide how to protect it.

Steps In Risk Management Process

- Form a risk management team
  - One from EDP/ADP/IRM/etc.
  - User who knows what they can lose
  - Could be formal or informal
  - Depends on size of organization
- Identify and value the assets
- Identify potential threats (what could happen)
- Determine likelihood of occurrence of threats
- Calculate the exposures (the vulnerable areas and their values)
- Introduce safeguards
  - for largest exposure first
  - only when benefit exceeds cost

TREATS TO COMPUTER SYSTEMS

Threats By People	
Unintentional Employee Action	50-60%
Intentional Employee Action	15-20%
Outside Actions	1- 3%
Physical & Environmental Threats	
Fire Damage	10-15%
Water Damage	5-10%
Electrical Fluctuations	1- 5%
Natural Disaster	1%
Other	**5-10%**

Technical Vulnerabilities

- Trap Door
- Time Bomb
- Trojan Horse
- Mouse Trap
- Virus

PC Vulnerabilities

- Population Increasing
- Portability
- Physical Accessibility
- Lack of Built-in Security Mechanisms
- Nature of Data Handled
- Compactness of media
- User Education
- Local Area Networks
- Multiple Operators
- Growth of Computer Crime
- Virus Infections

Hardware Concerns

- Access
- Theft
- Environmental considerations
- Media protection
- Media declassification/destruction
- Lack of built in security mechanisms
- Electromagnetic emanations (TEMPEST)
- Hardware modifications
- Hardware attacks

Software Concerns

- Viruses, unauthorized changes to programming code, backups not made, program errors
- Errors, inadequacies, backup system software
- Software not inventoried or controlled, Software Publisher's Association
- Worms along network - Morris/Cornell/INTERNET case
- Check all disks before using. Use of scanner or detector
- Problem of correct software use

Computer Viruses

Self Propagating Routine That Can Have Destructive Properties

Sources of Virus Infection

- Bulletin boards
- Pirated software
- Shareware
- Public domain software
- Commercial software packages
- Networks
- Sabotage by employees, terrorists, crackers, or spies

Preventing Virus Infections

- Boot floppy based systems using a specific clearly labeled boot diskette
- Never boot a hard disk system from an unprotected diskette
- Never use untested software (test off line or on a single purpose dedicated system)
- Backup files and programs, securely store and routinely check for infection
- Minimize software sharing within the organization
- Prohibit use of unapproved software from any source
- Educate users to watch for changes in patterns of system activity
- Install virus detection software

Data Concerns

- Boot floppy based systems using a specific clearly labeled boot diskette
- Never boot a hard disk system from an unprotected diskette
- Never use untested software (test off line or on a single purpose dedicated system)
- Backup files and programs, securely store and routinely check for infection
- Minimize software sharing within the organization
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Levels of Data

DoD

- Level I - Classified
- Level II - Unclassified Sensitive
- Level III - Unclassified

Civilian Agencies

- Level 1 - Low Sensitivity/Criticality
- Level 2 - Medium Sensitivity/Criticality
- Level 3 - High Sensitivity/Criticality - confidential
- Level 4 - Extremely High Sensitivity/Criticality & Classified

Applying Common Sense

Sophisticated security systems can fail if common sense is not used.

Examples:

- Fancy lock on computer room door, door propped open
- List of instructions not secure
- User ID, password taped to monitor
- Password obvious (for example, person's name)
- References not checked when hiring
- Confidential diskettes left out in open

APPLYING COMMON SENSE COSTS NOTHING

Penetration and Countermeasure

Access sensitive information	Encryption
Features not used	Implement protection
Implied Sharing	Capabilities
Parameters	Check user supplied
Line disconnect	Hang up
Carelessness	Employee Training
Passwords	Proper Management
Repetition	Hang up & Notify
Leakage	Shielding, Encryption
Waste	Destroy

Passwords

The Use of Passwords Should Follow These Guidelines

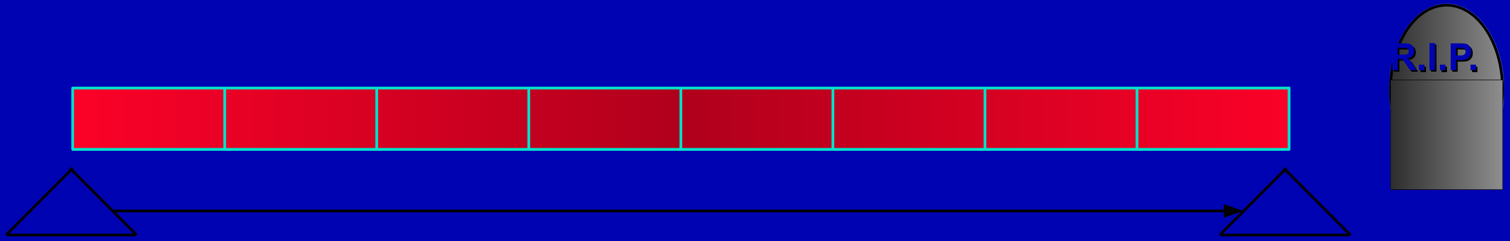
- No repeat guesses
- Log unsuccessful attempts
- Review log
- Never write down sensitive combinations
- Hard to guess passwords
- Change frequently
- Easy to recall, hard to guess
- Don't disclose

Physical Access Controls

- Restricted access
- Signs, locked doors, etc.
- Solid doors
- ID cards and badges
- Computer controlled access cards
- Access log
- Closed-circuit TV
- Procedures re: unauthorized person

INFOSEC Life Cycle Management

Life Cycle Phases



Design and Development

Fabrication and Production

Acquisition and Procurement

Test and Evaluation

Shipping and Delivery

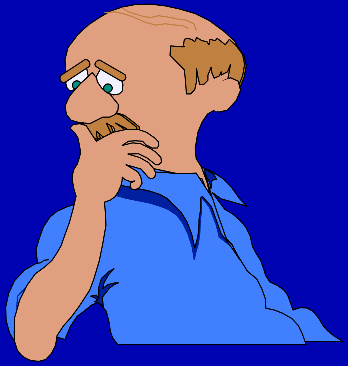
Operations

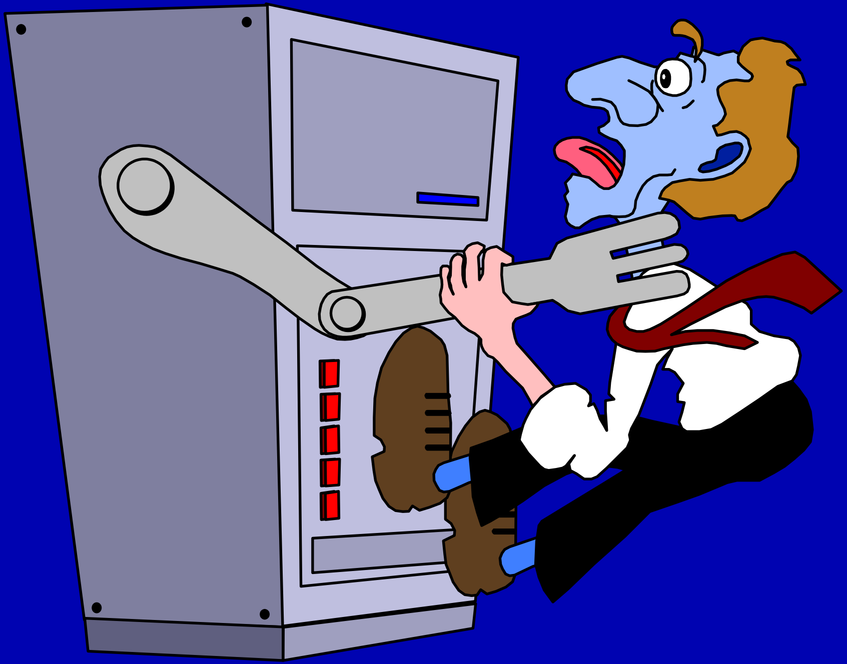
Maintenance

Obsolescence and Removal

Disaster Recovery

PRIOR PLANNING PREVENTS POOR PERFORMANCE





Contingency Planning

Three major topics in contingency planning

- Backups and Procedures
  - How often?
  - Backup what?
- Catastrophe Planning
  - Making the plan
  - Disaster stages
  - Contents of plan
- Security in Backup

Items in Contingency Plan

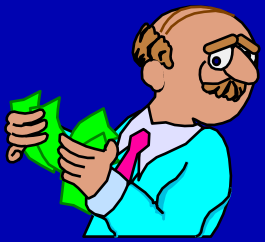
- Emergency Response Team List
- Secure Storage Site
- Complete Archive Backup
- Current Complete Backup
- Current Incremental Data Backups
- Hardware Backups and Tests
- TESTING
- Insurance and Financial Matters

Resources and $$$

Our Security Mission Still Must Be Met With Ever Decreasing Budgets

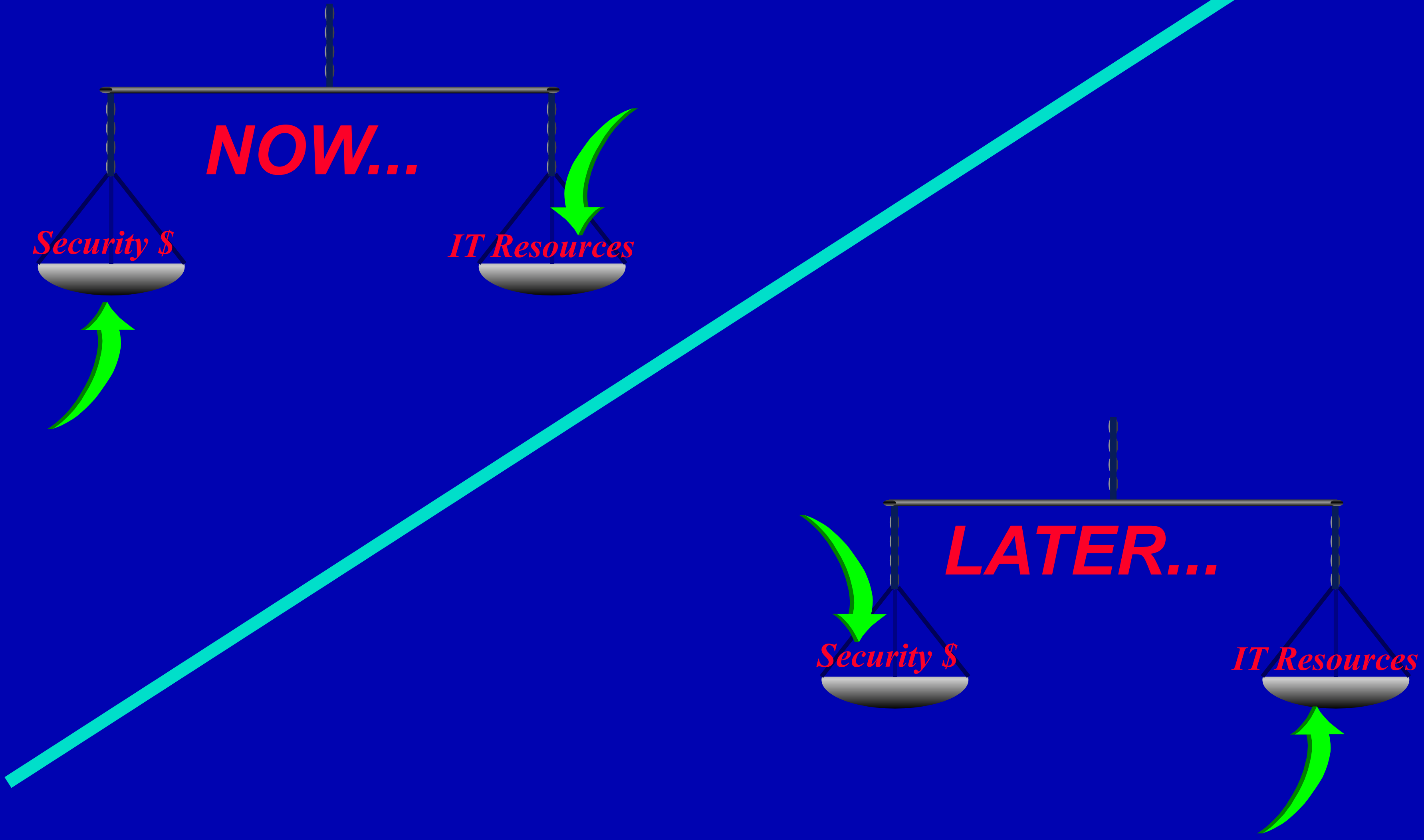
Today

Tomorrow



Next Year

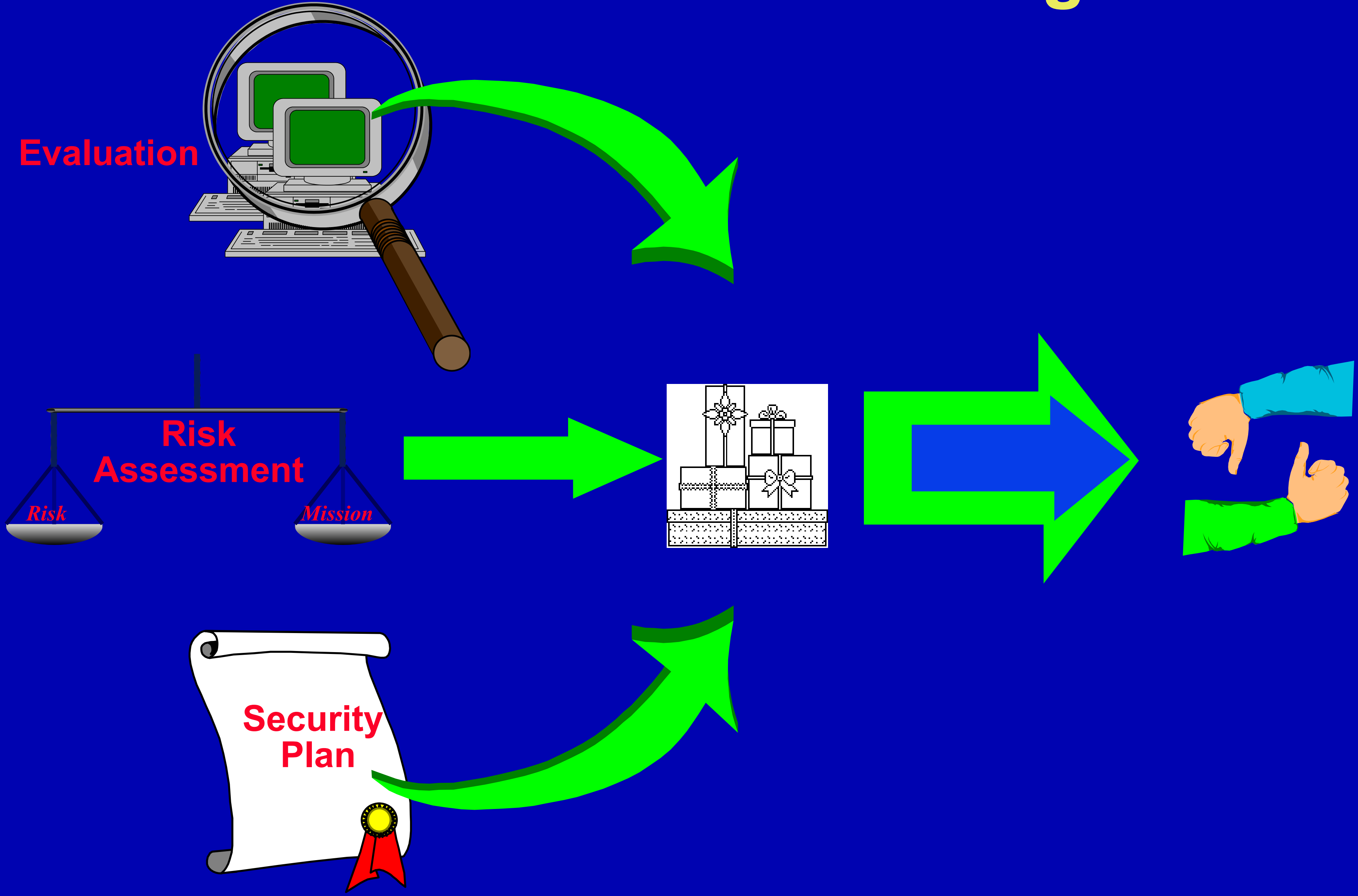
Costs and Benefits



AIS Accreditation

- Supported by:
    - Certification
    - Risk Management Process
- Reviewed every three years or upon major modification

The Certification Package



Why Use a LAN

- Cost
- Reliability
- Distribution of Work
- Expendability
- Flexibility

Metropolitan Area Network (MAN)

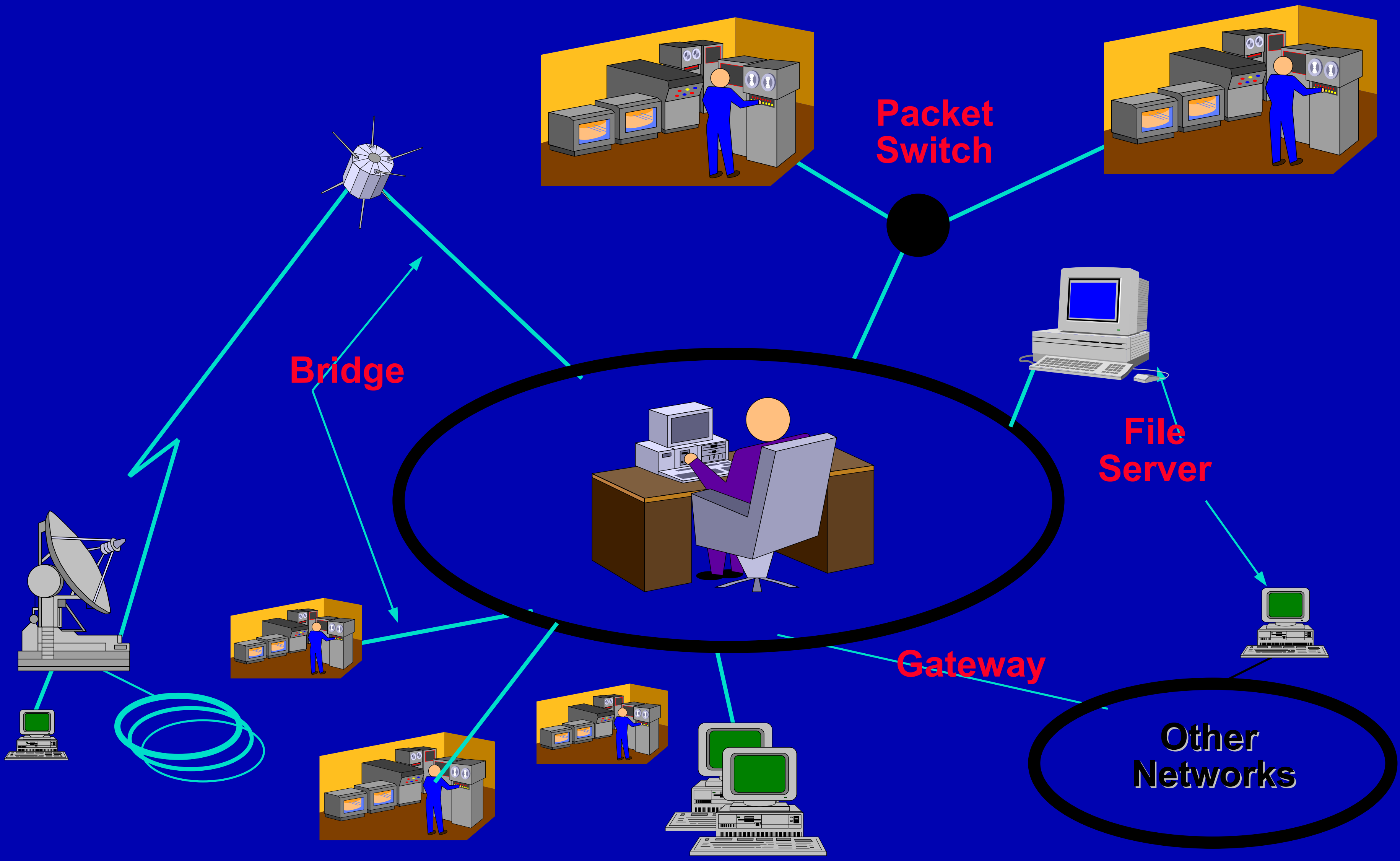
- Moves Information Between Buildings
- Also Called a “Campus Network”

Wide Area Network (WAN)

- An Integrated Voice/Data Network Which Links Metropolitan Networks
- Often Uses Established Common-Carrier Lines

Putting It Together

Inter-connectivity



Network Vulnerabilities

- Access by unauthorized individuals
- Lack of physical control
- General lack of monitoring/auditing features
- Identification and control of dial-in-users
- Failure to backup critical data
- Sensitive to outside interference
- Virus infection

Network Physical Security

Role of Systems Security Officer (SSO)

- Administer the data security function
- Give service to management to make proper security easy
- In small environment, system manager may do the SSO duties
- Important to designate someone as being responsible and accountable for security and control