Federal Information Systems Security Educators Association

I Touch the Future, I Teach.

Crista McAuliffe

A Product of the

National Information Assurance
Training and Education Center

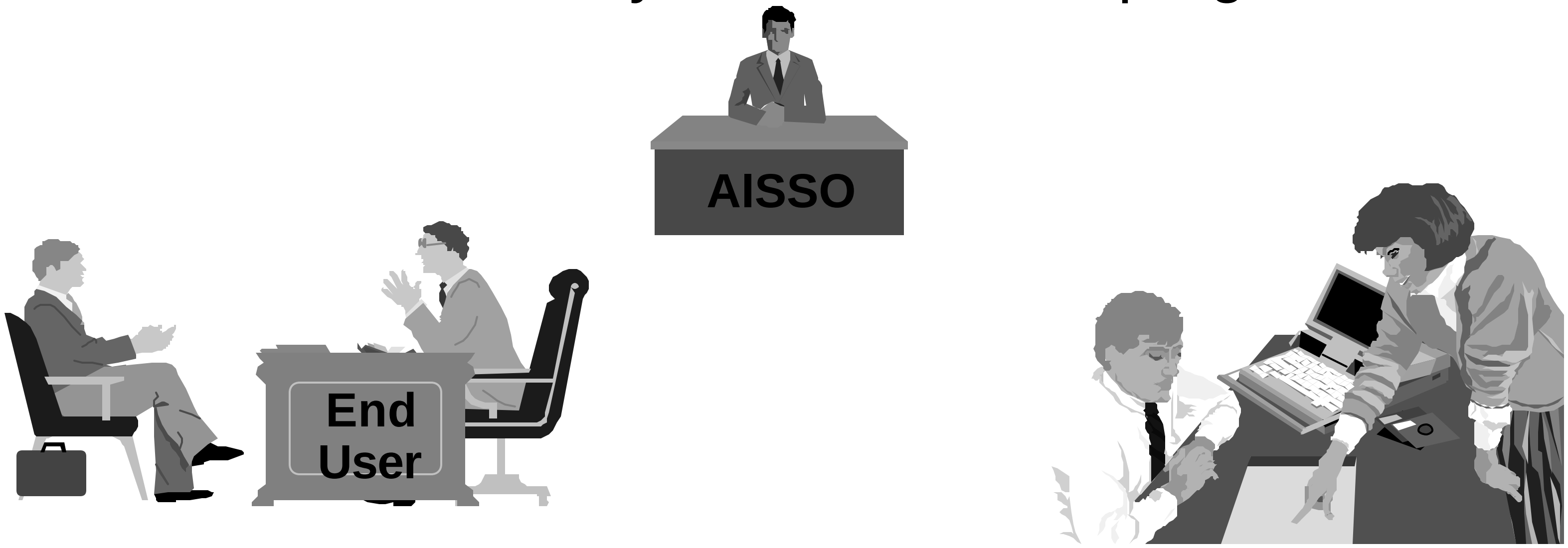
Idaho State University

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



AISSO

End User

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

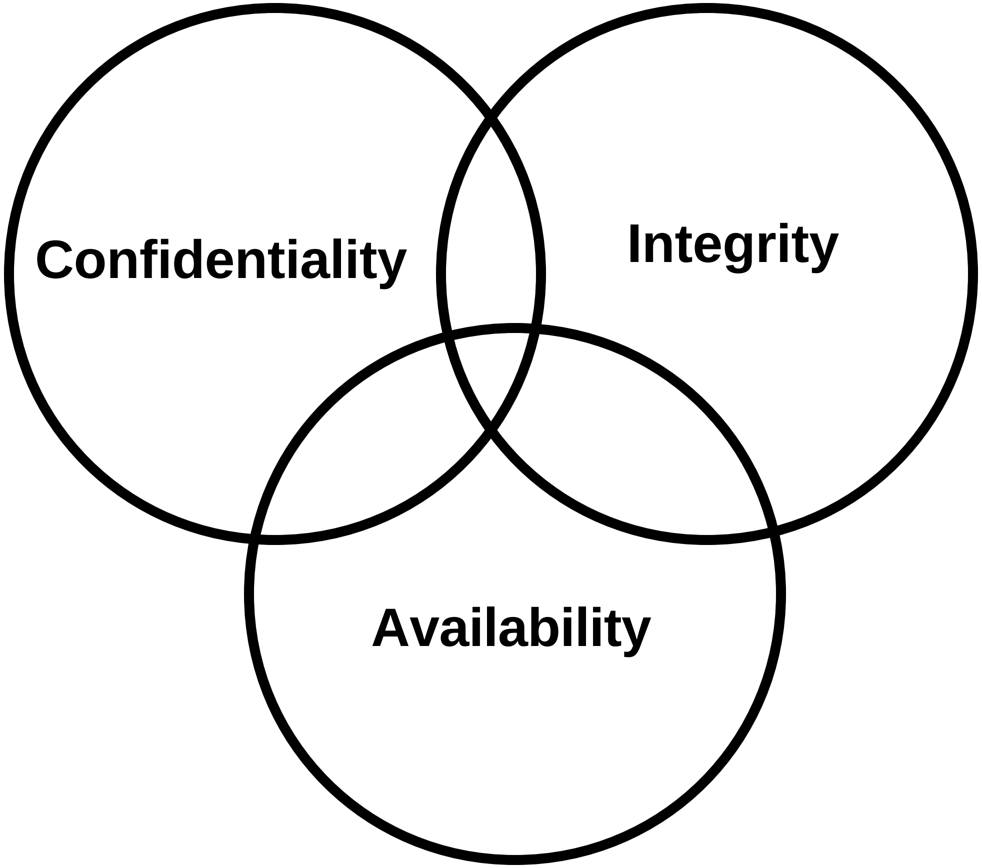
- Compromise
- Integrity

More Definitions

- Sensitive Information
- Confidentiality
- Integrity
  - Store
  - Process
  - Transmit

Current Issues

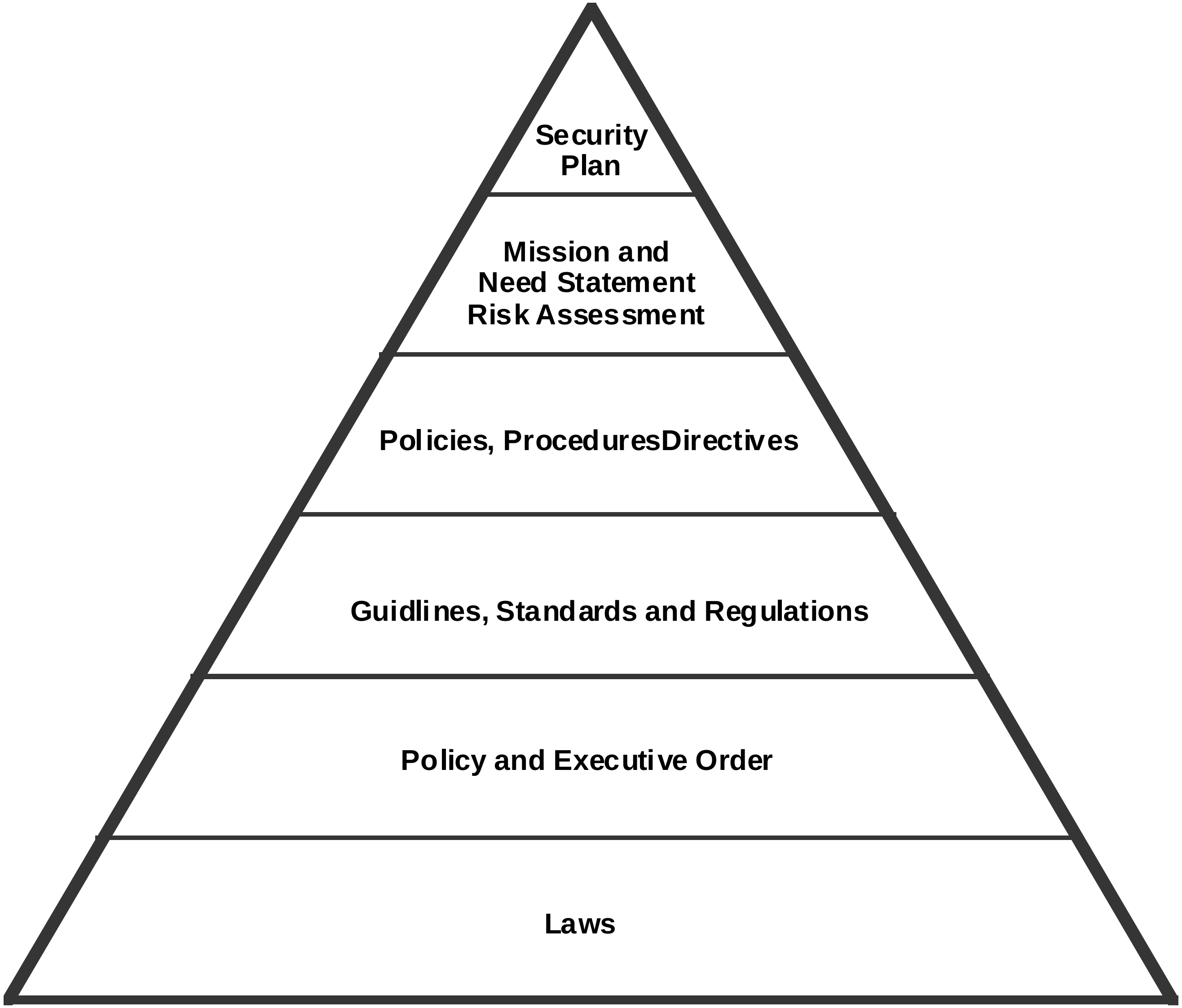
Confidentiality, Integrity, Availability



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

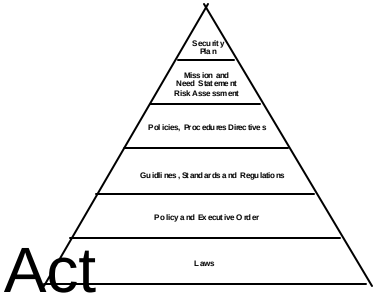
Guidlines, Standards and Regulations

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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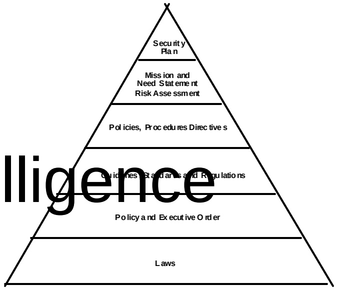
Applicable Policy and Executive Orders

- 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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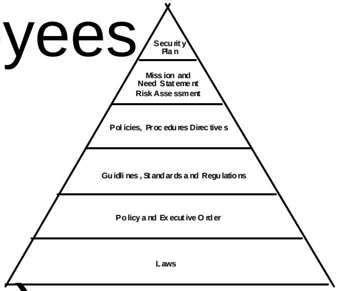
Guidelines

- 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
- General Services Administration (GSA)
  - Provides Training Services for Users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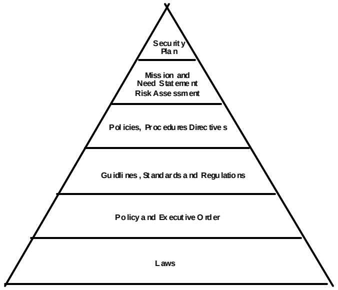
Agency and System Documentation

- Policies, Procedures, Guidelines
- Obtain These From Your Federal Agency
  - These are Agency-wide Computer Documents
  - They Will be Specific to Your Organization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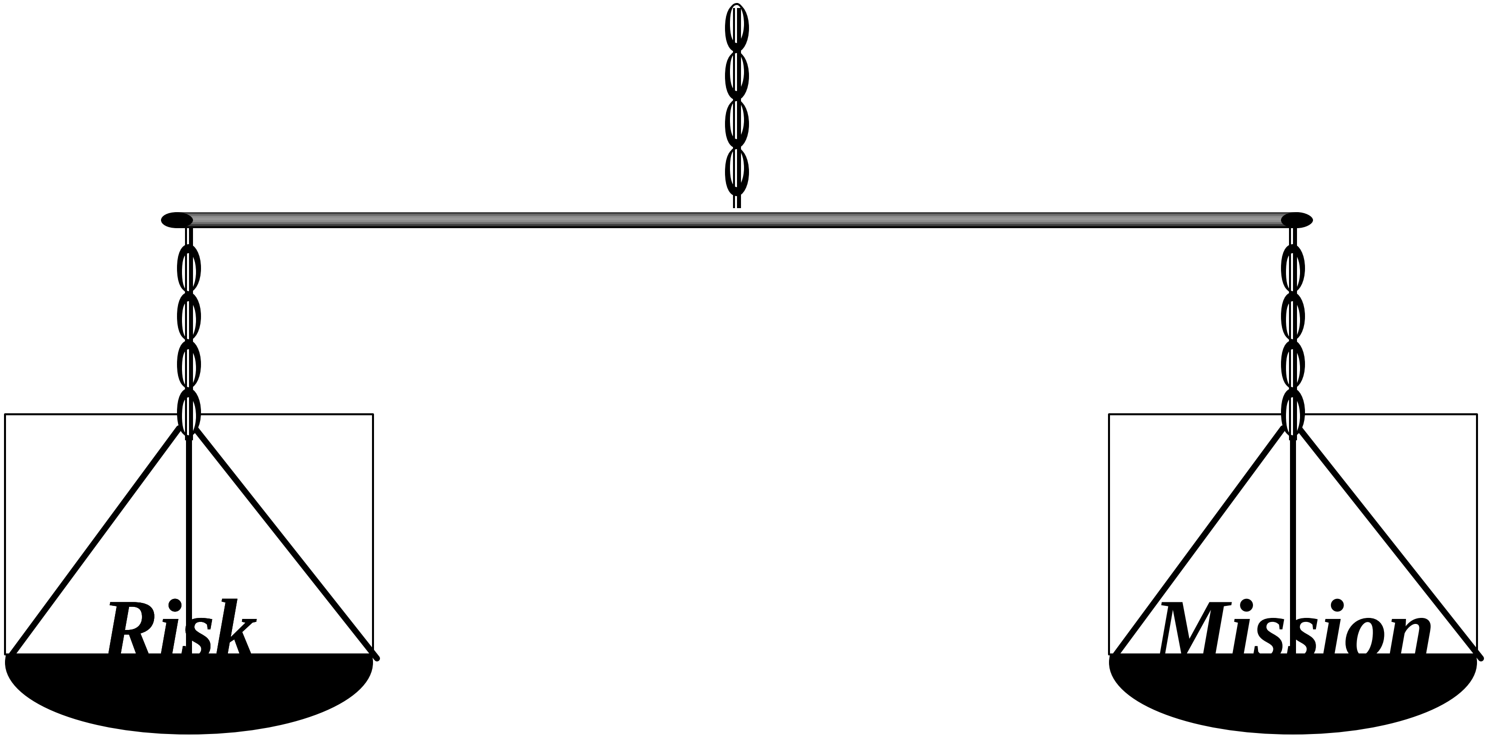
Risk Management

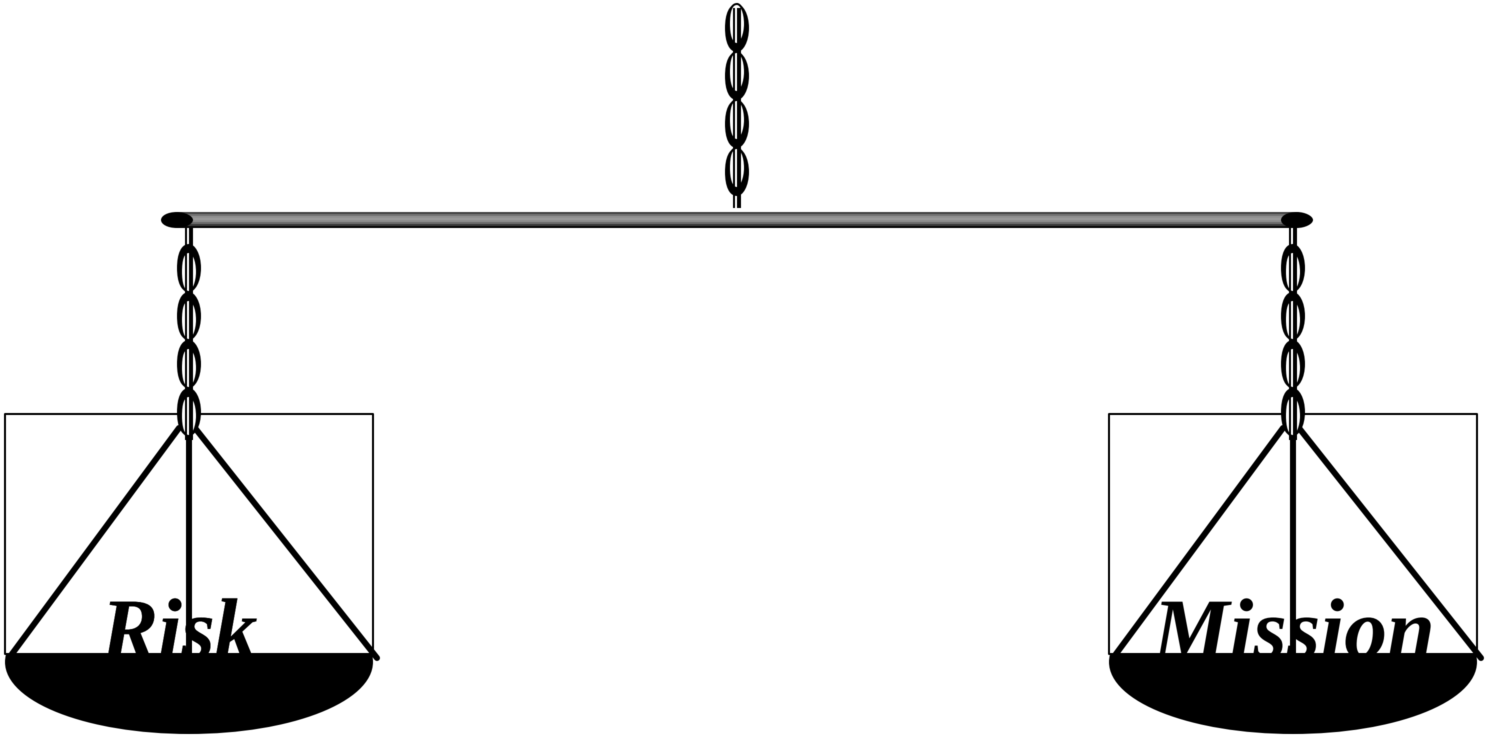
INFOSEC IS BASED ON RISK
“You Cannot Protect Everything From Everybody



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
  - 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
- Multiple Operators
- Nature of Data Handled
- Compactness of media
- User Education
- Local Area Networks
- Growth of Computer Crime
- Virus Infections
- Mechanisms

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
- Prohibit use of unapproved software from any source
- Educate users to watch for changes in patterns of system activity
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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

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

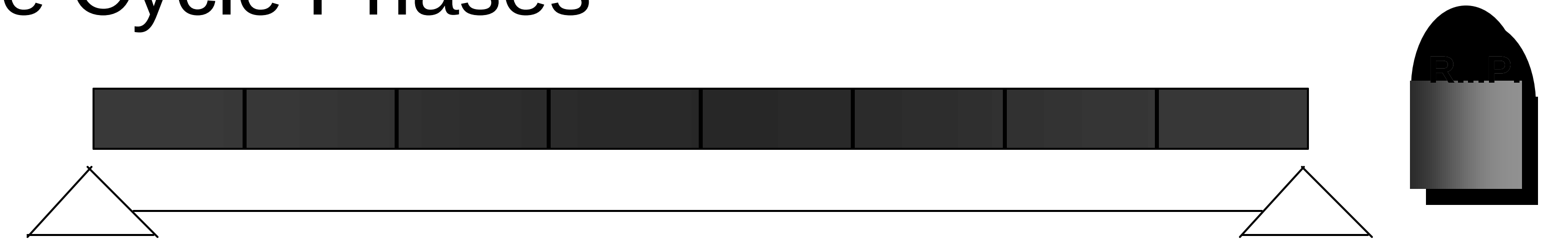
- The Use of Passwords Should Follow These Guidelines
- No repeat guesses
- Log unsuccessful attempts
- Review log
- Never write down sensitive combinations
- Hard to guess passwords
- Change frequently
- Easy to recall, hard to guess
- Don't disclose

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

AcquisitionTest and Evaluation

Shipping and Delivery

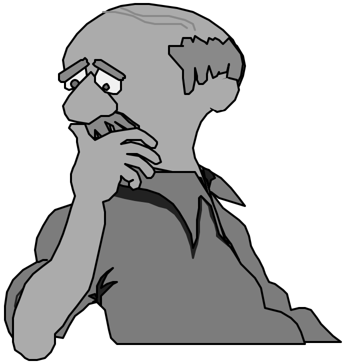
Operations

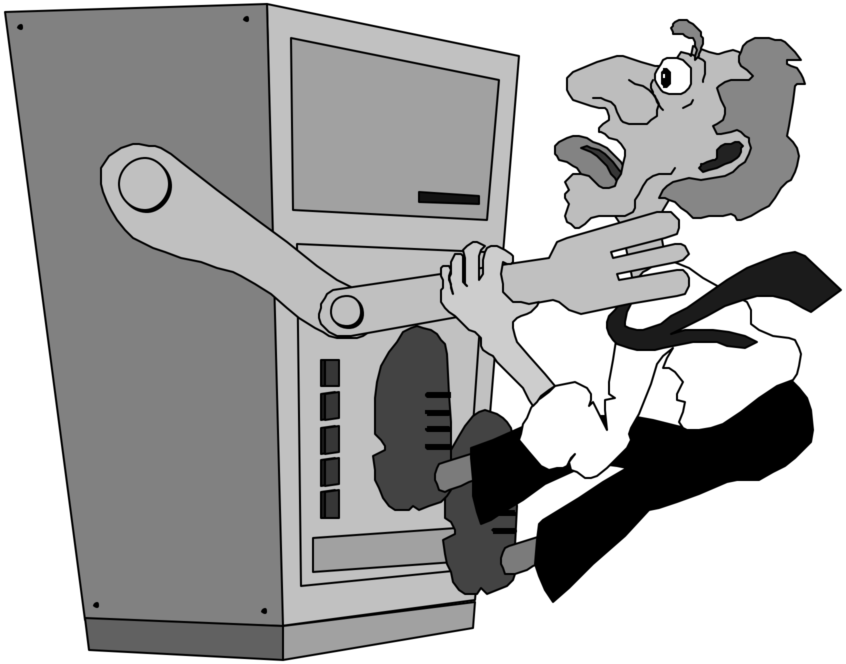
Maintenance

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

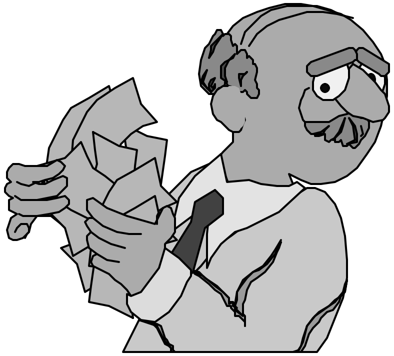
Items in Contingency Plan

- 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

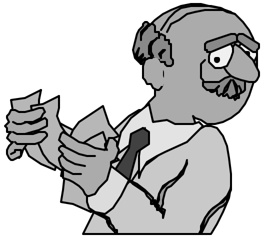
Resources and $$$

Our Security Mission Still Must Be Met With Ever Decreasing Budgets

Today

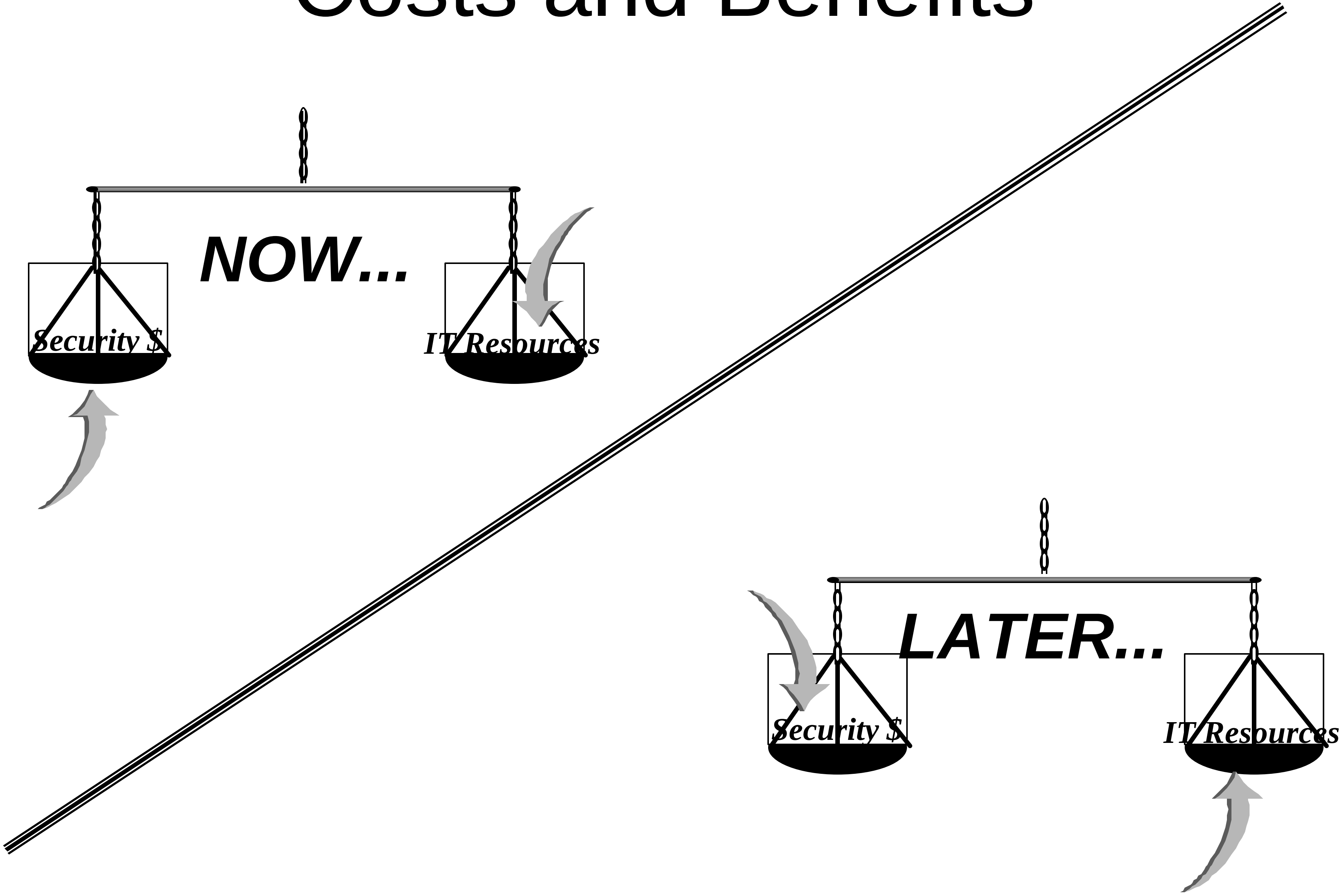


Tomorrow



Next Year

Costs and Benefits



NOW...

Security $

IT Resources

LATER...

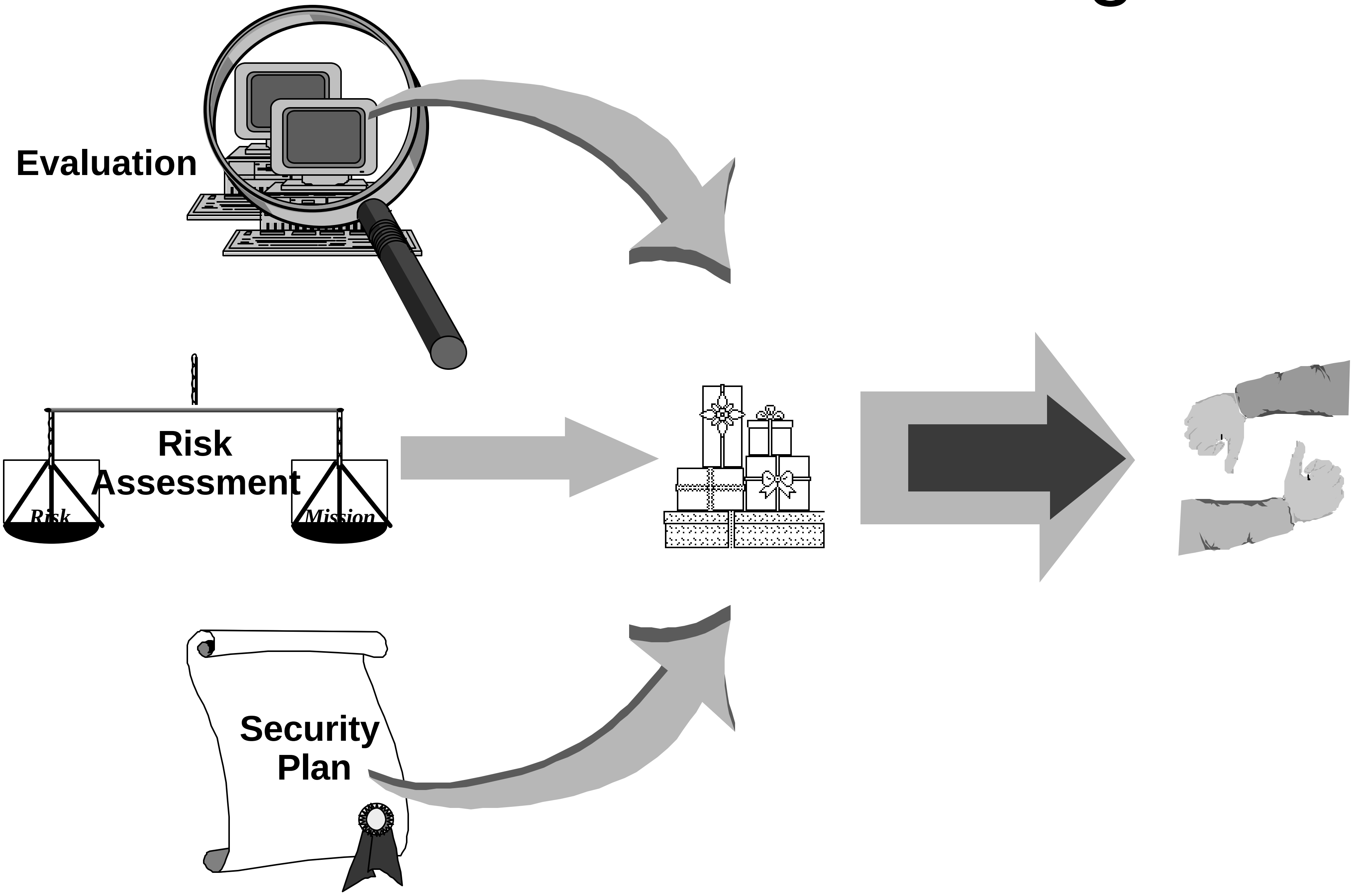
Security $

IT Resources

AIS Accreditation

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

The Certification Package



Evaluation

Risk Assessment

Security Plan

Why Use a LAN

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

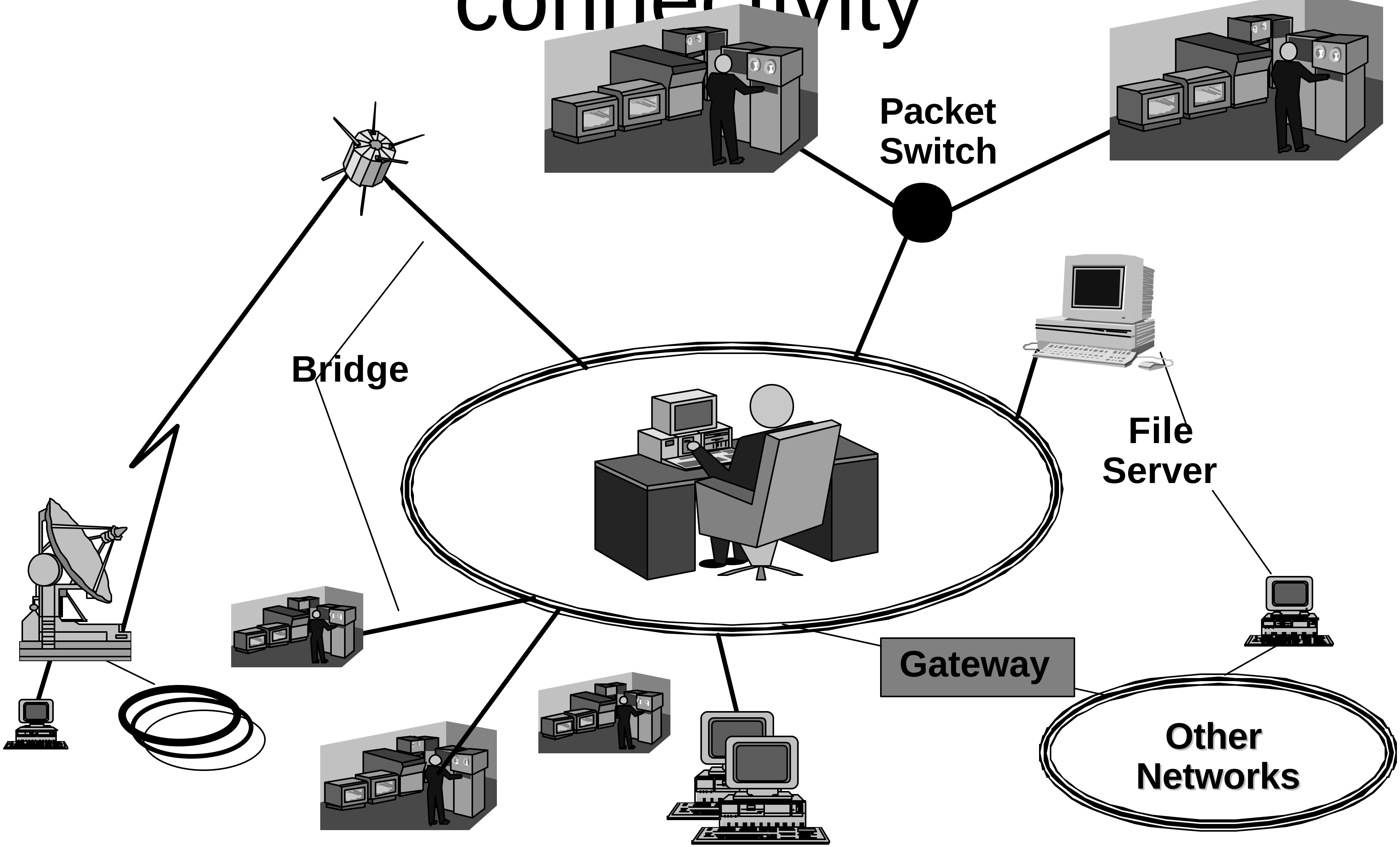
Metropolitan Area Network (MAN)

- 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

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