Last Minute Reminder
CC – Certified in Cyber Security

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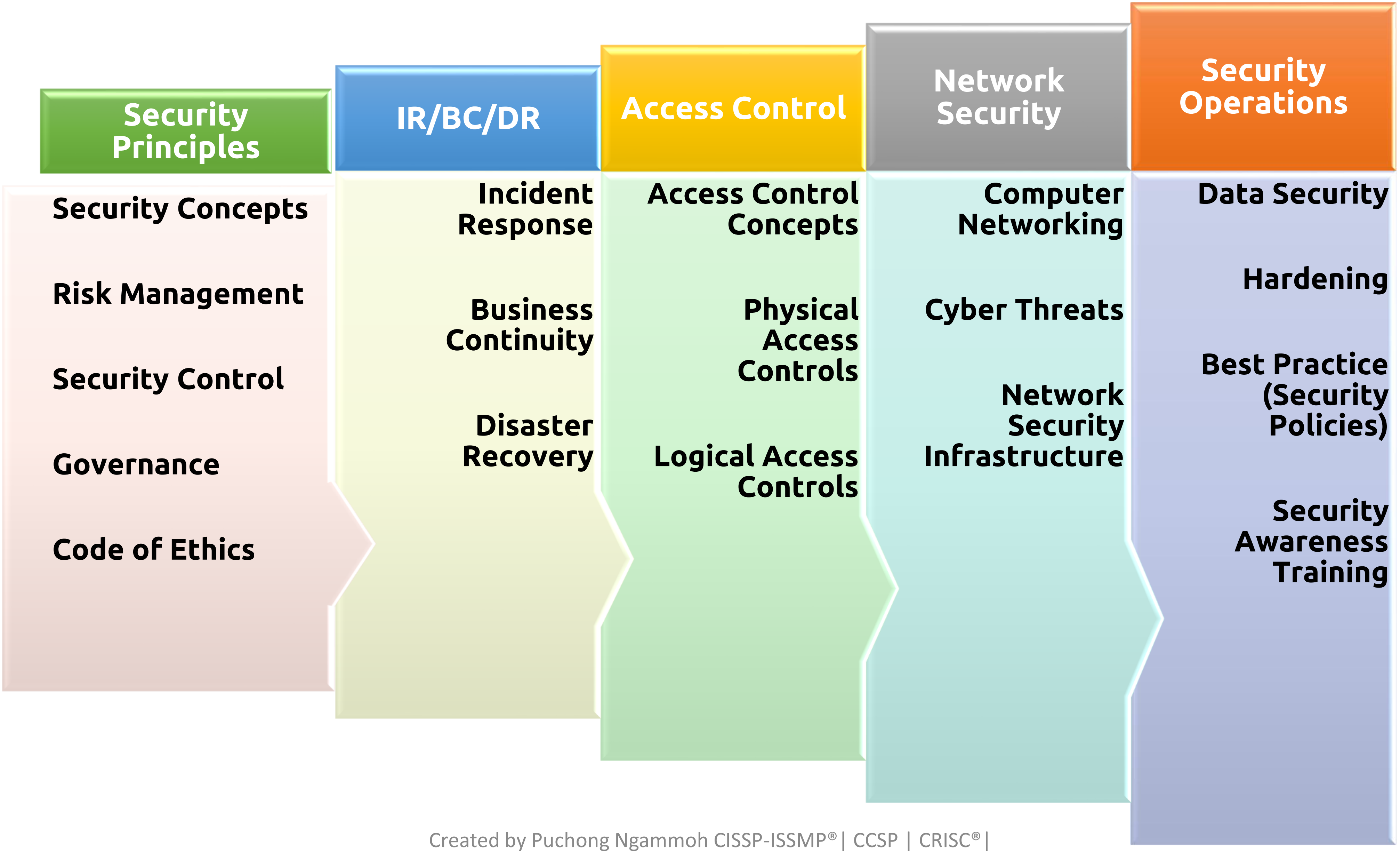

Security Principles

- Security Concepts
- Risk Management
- Security Control
- Governance
- Code of Ethics

IR/BC/DR

- Incident Response
- Business Continuity
- Disaster Recovery

Access Control

- Access Control Concepts
- Physical Access Controls
- Logical Access Controls

Network Security

- Computer Networking
- Cyber Threats
- Network Security Infrastructure

Security Operations

- Data Security
- Hardening
- Best Practice (Security Policies)
- Security Awareness Training

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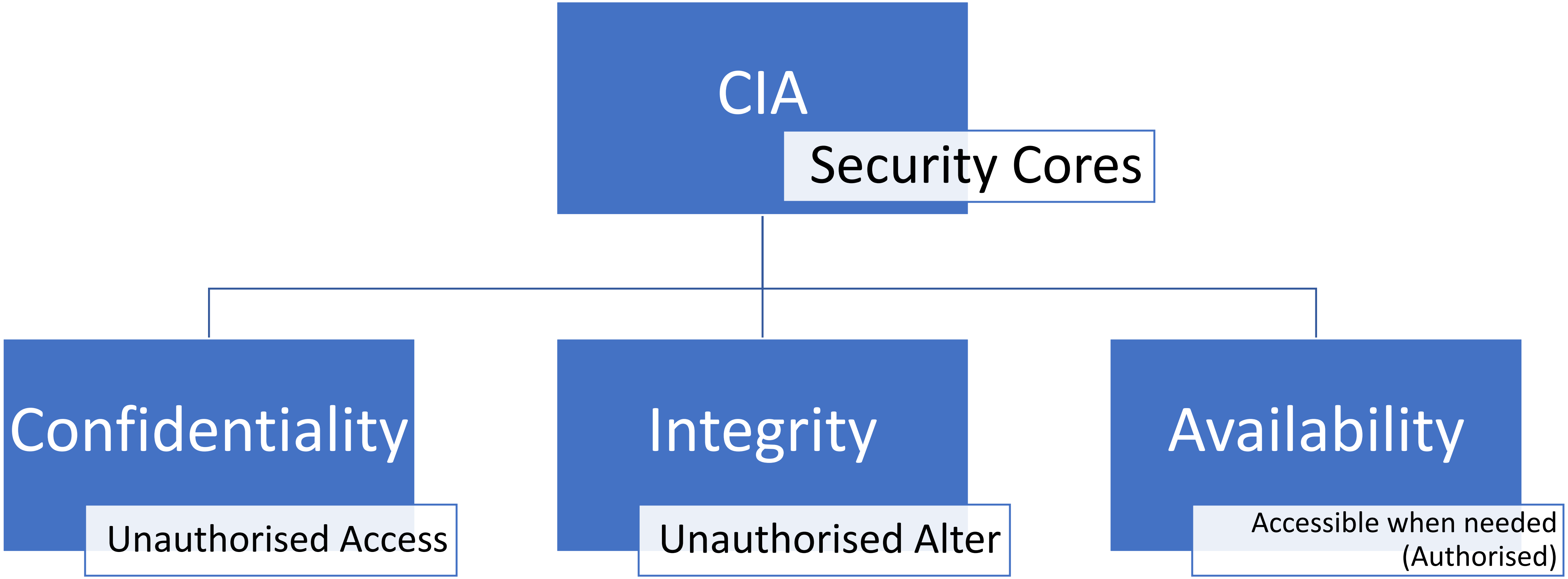
Security Principles



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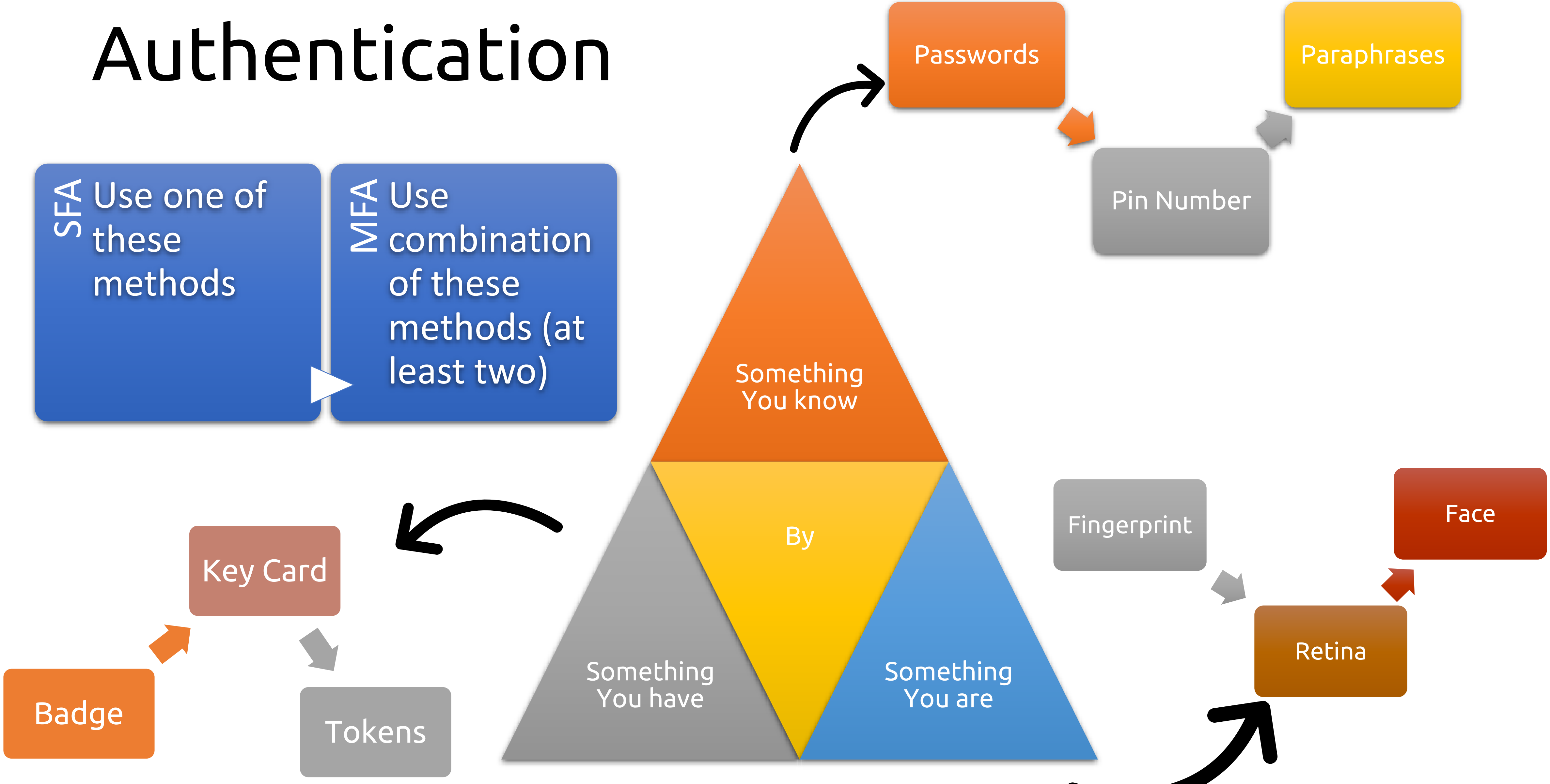
Authentication



SFA: Use one of these methods

MFA: Use combination of these methods (at least two)

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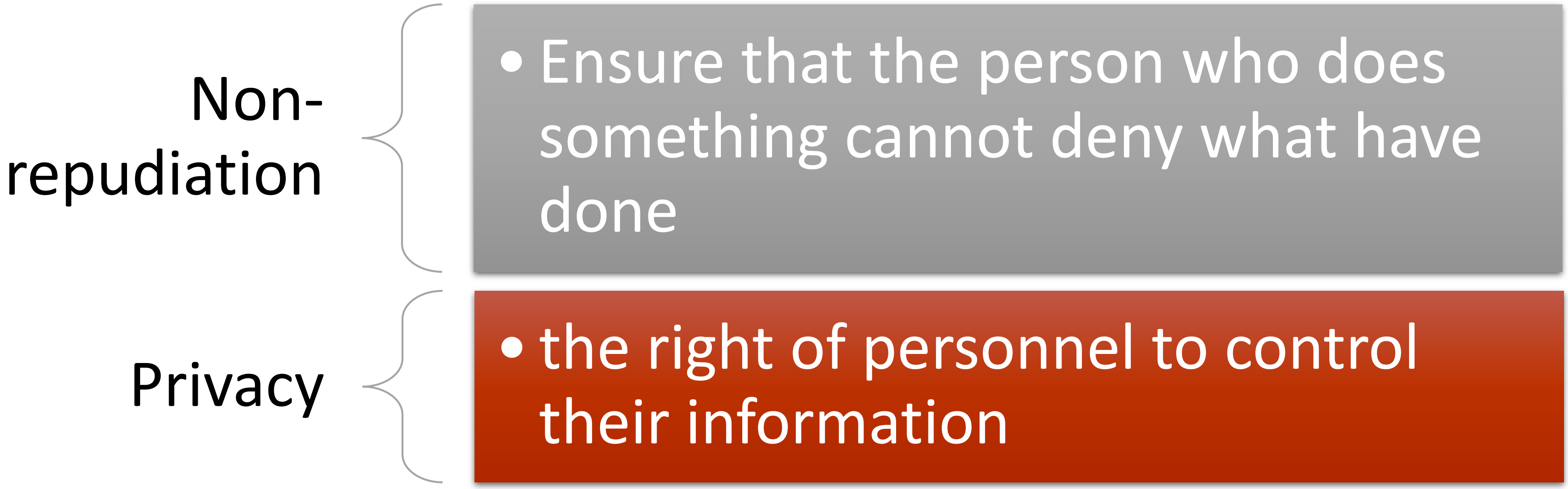
Method of Authentications



Non-repudiation

- Ensure that the person who does something cannot deny what have done

Privacy

- the right of personnel to control their information

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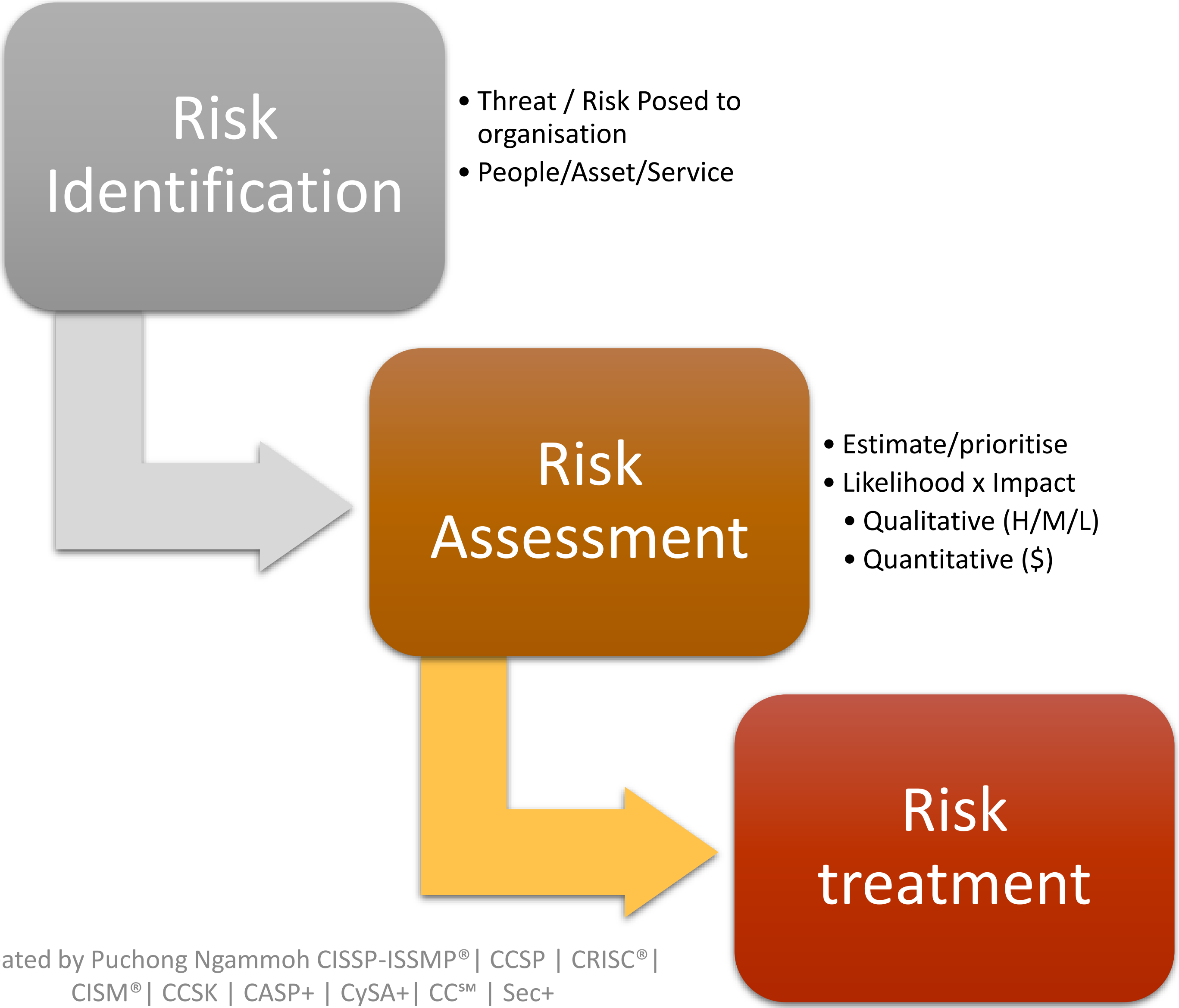
Risk Management



Risk Identification

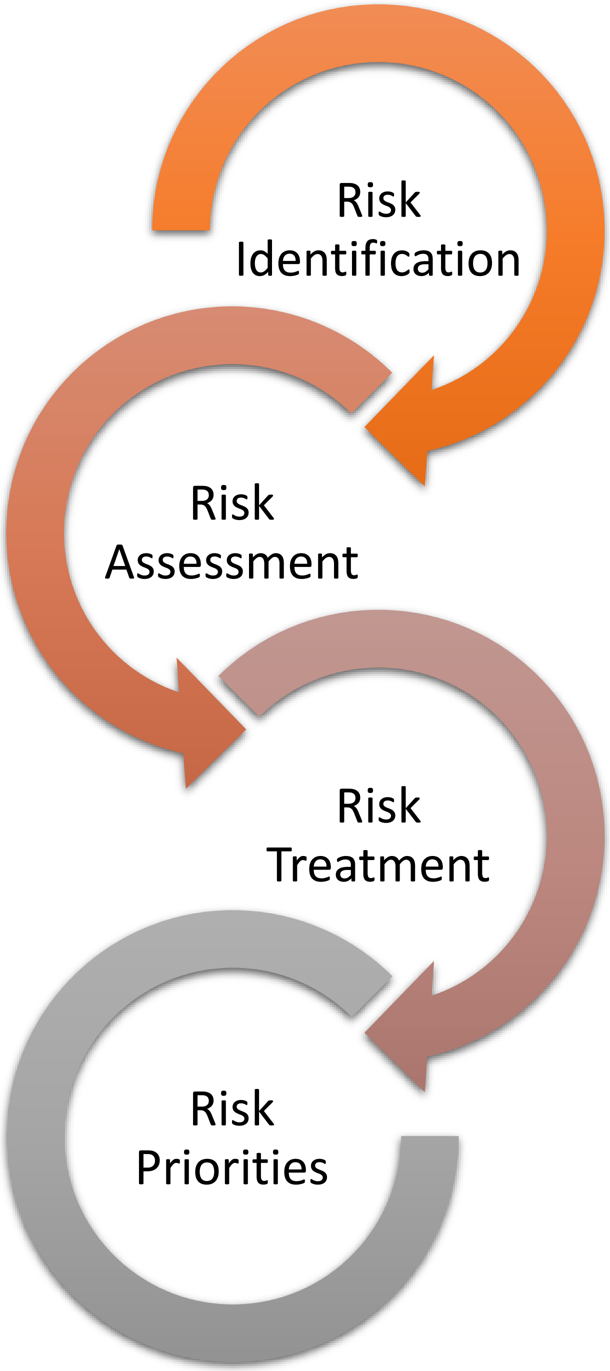
- Threat / Risk Posed to organisation
- People/Asset/Service

Risk Assessment

- Estimate/prioritise
- Likelihood x Impact
  - Qualitative (H/M/L)
  - Quantitative ($)

Risk treatment

- Risk Mitigation
  - Reduce impact/Likelihood
- Risk Transfer
  - Insurance
- Risk Acceptance
  - Do nothing (Risk vs Opportunity)
- Risk Avoidance
  - Change to other ways



Risk Identification

Risk Assessment

Risk Treatment

Risk Priorities

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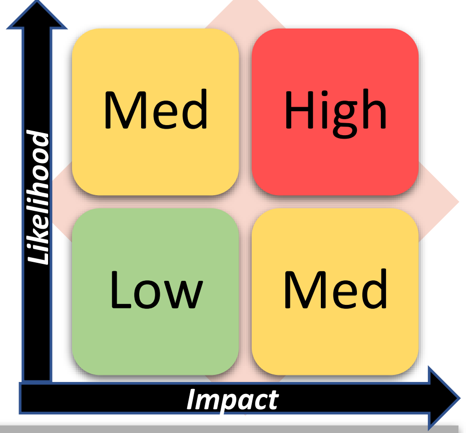
Risk Priorities / Risk Tolerance



Risk Priorities

- Priority based on Impact x Likelihood
- Help in prioritising risk treatment

Risk Tolerance

- Limit of level of risk, acceptable by senior management (associated with risk appetite)

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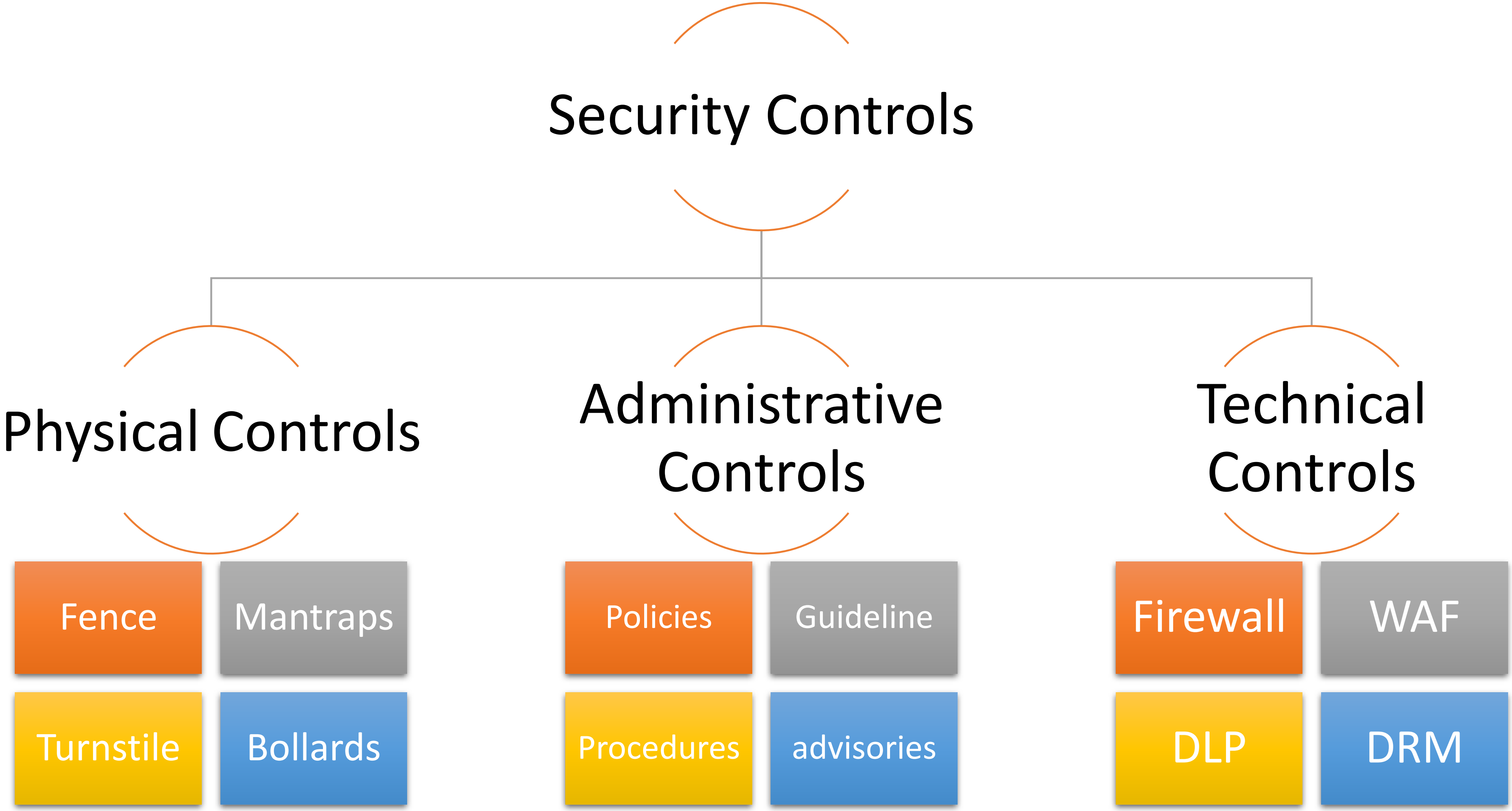
Security Controls



Security Controls

- Physical Controls
  - Fence
  - Mantraps
  - Turnstile
  - Bollards
- Administrative Controls
  - Policies
  - Guideline
  - Procedures
  - advisories
- Technical Controls
  - Firewall
  - WAF
  - DLP
  - DRM

Governance

Regulations/Laws

- HIPPA (Medical records)
- GDPR (PII)

Policies (Broad)

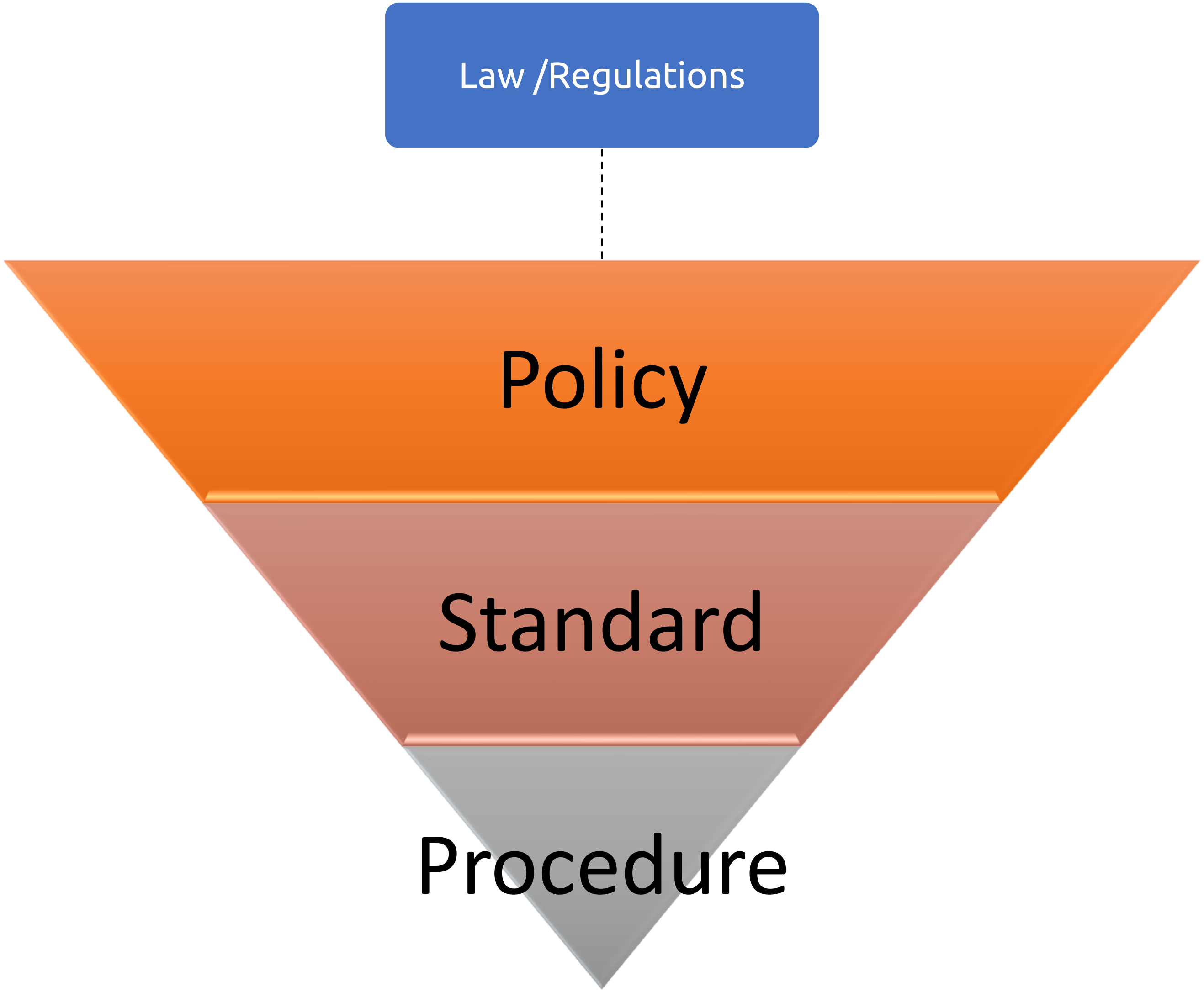
- AUP
- Access Control Policy

Standard (may include technical controls)

- ISO
- NIST
- PCI DSS

Procedures (Day-to-Day Operations)

- Special Tasks
- routine activities



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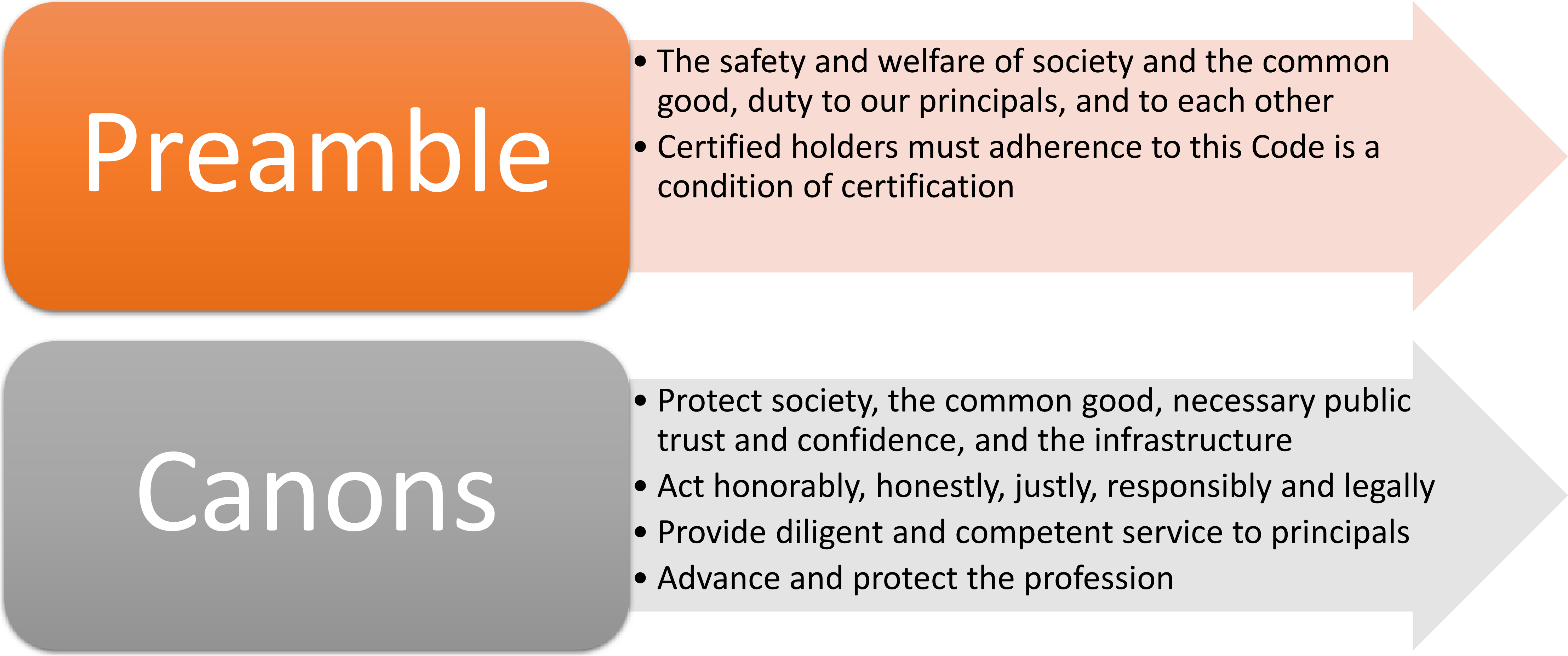
Code of Ethics



Preamble

- The safety and welfare of society and the common good, duty to our principals, and to each other
- Certified holders must adherence to this Code is a condition of certification

Canons

- Protect society, the common good, necessary public trust and confidence, and the infrastructure
- Act honorably, honestly, justly, responsibly and legally
- Provide diligent and competent service to principals
- Advance and protect the profession

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Chapter 2 : IR/BC/DR

Breach
Incident
Intrusion
Event
Vulnerability
Exploit
Threat
Zero-Day

Goal of IR

- To reduce impact of incident

Goal of BC

- To keep critical operation running during the right of personnel to control their information disaster

DR

- To get operation back to normal state during disaster

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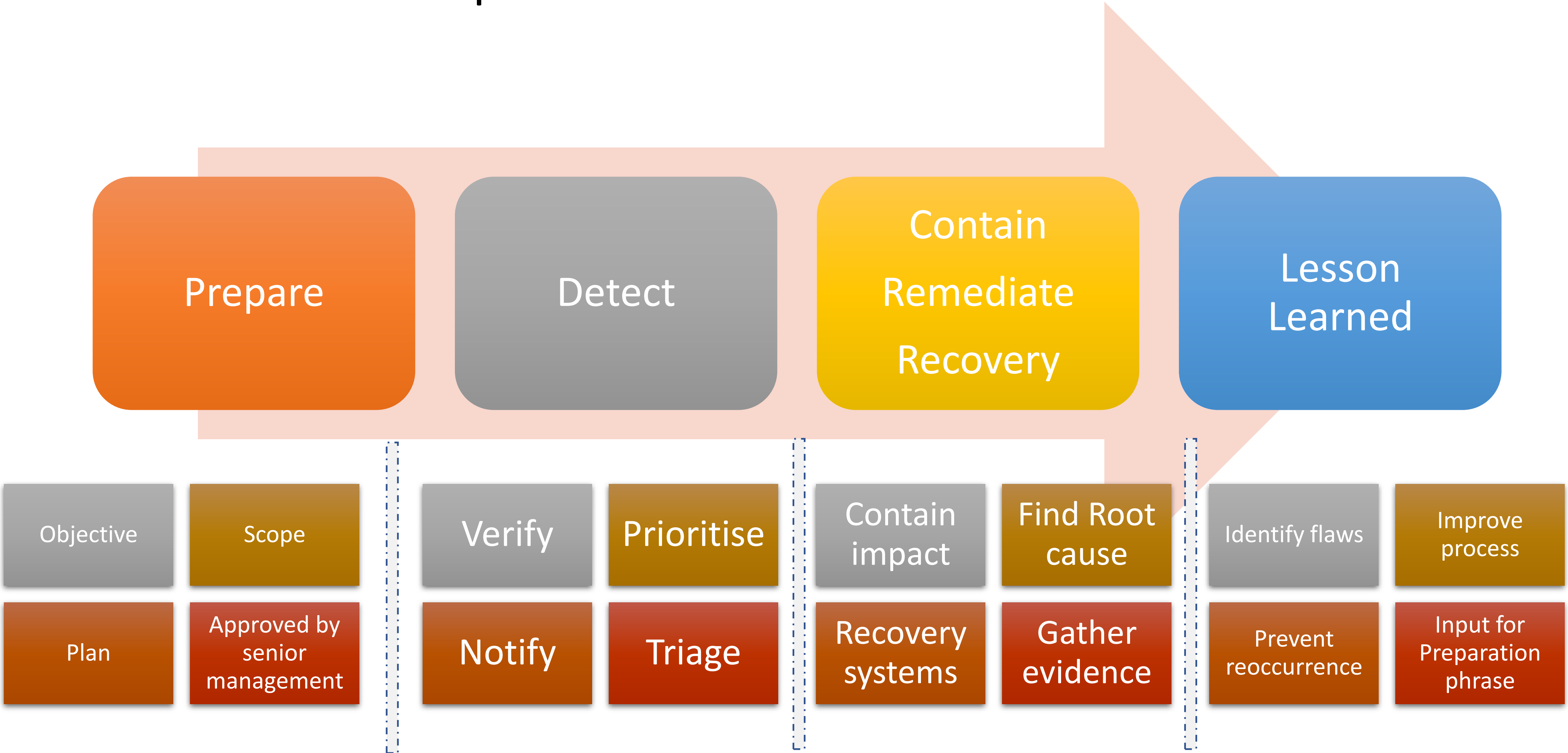
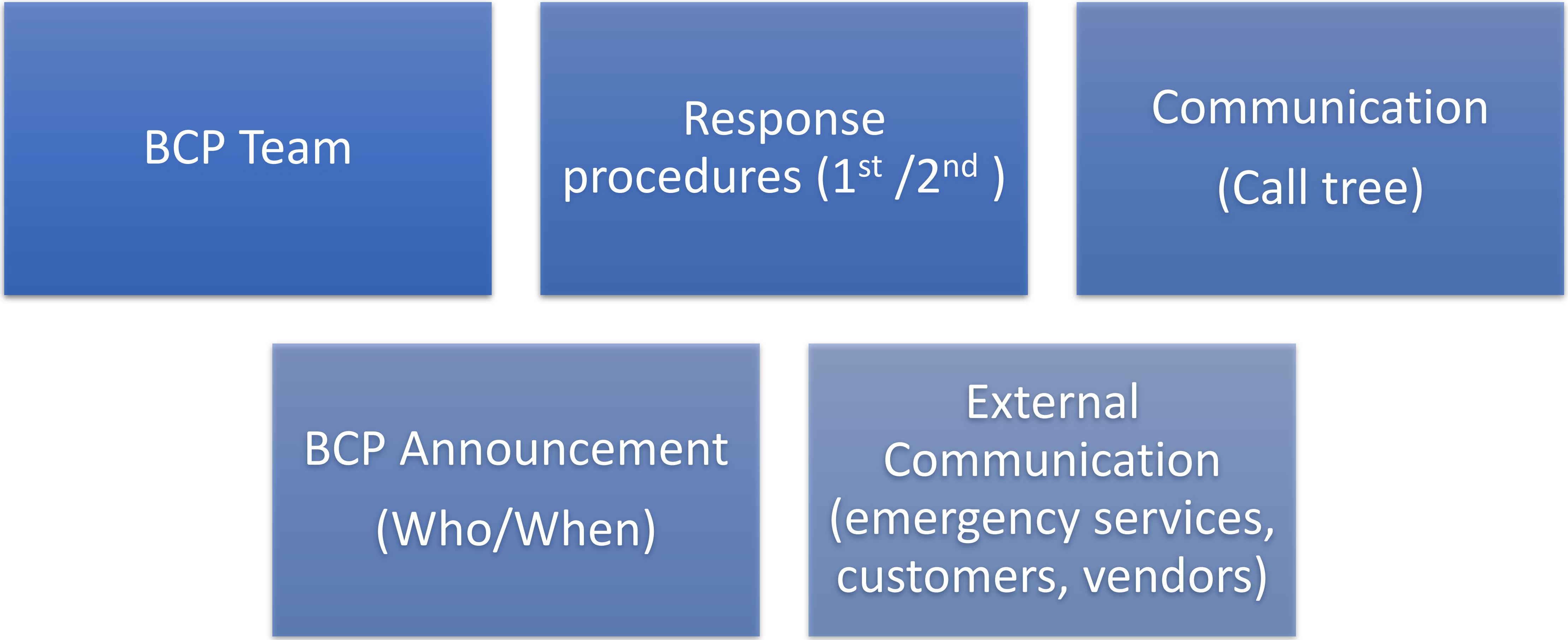
Incident Response Processes



Business Continuity



BCP Team

Response procedures (1st /2nd)

Communication

(Call tree)

BCP Announcement

(Who/When)

External Communication (emergency services, customers, vendors)

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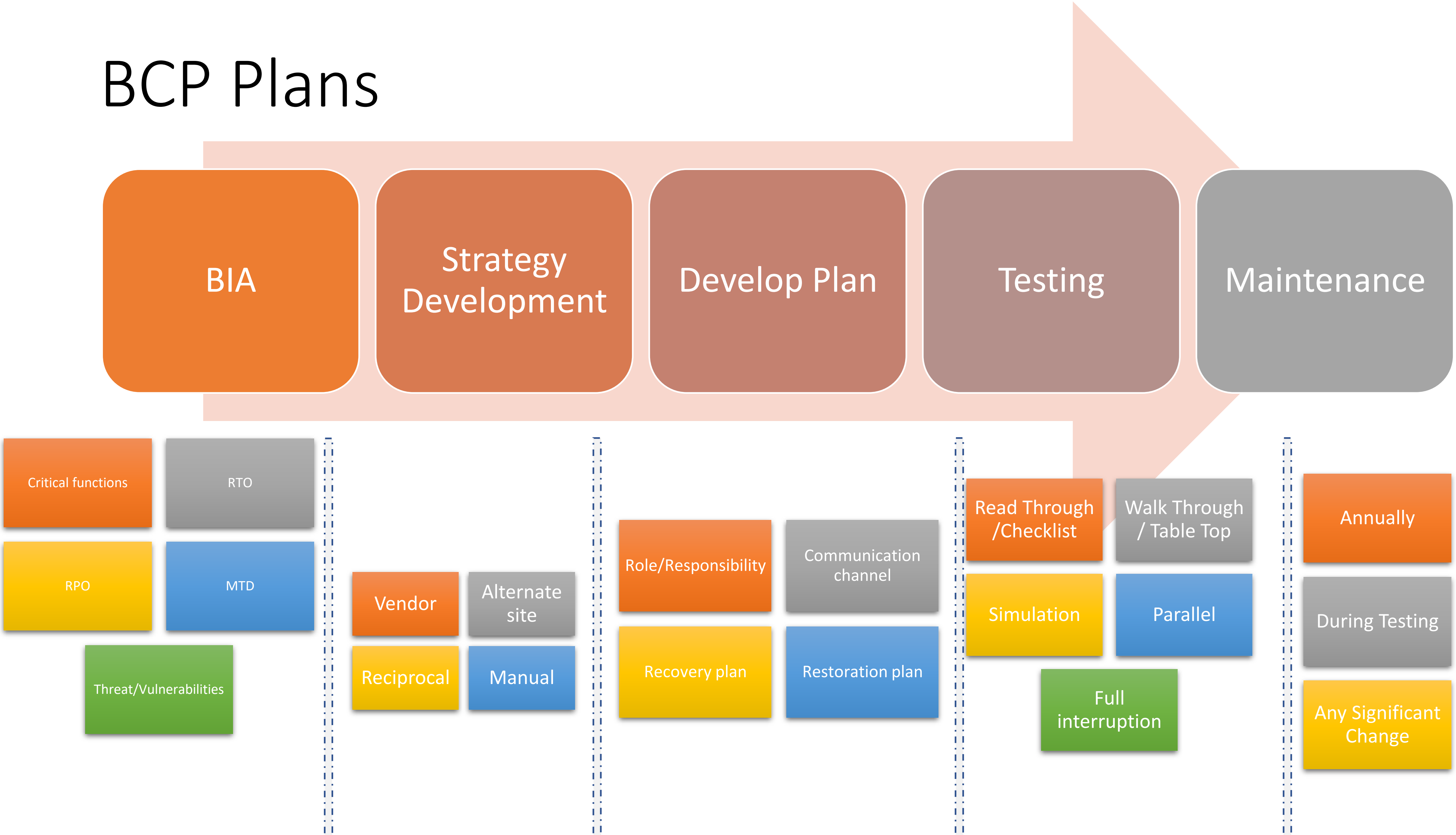
BCP Plans



BIA

Critical functions

RTO

RPO

MTD

Threat/Vulnerabilities

Strategy Development

Vendor

Alternate site

Reciprocal

Manual

Develop Plan

Role/Responsibility

Communication channel

Recovery plan

Restoration plan

Testing

Read Through /Checklist

Walk Through / Table Top

Simulation

Parallel

Full interruption

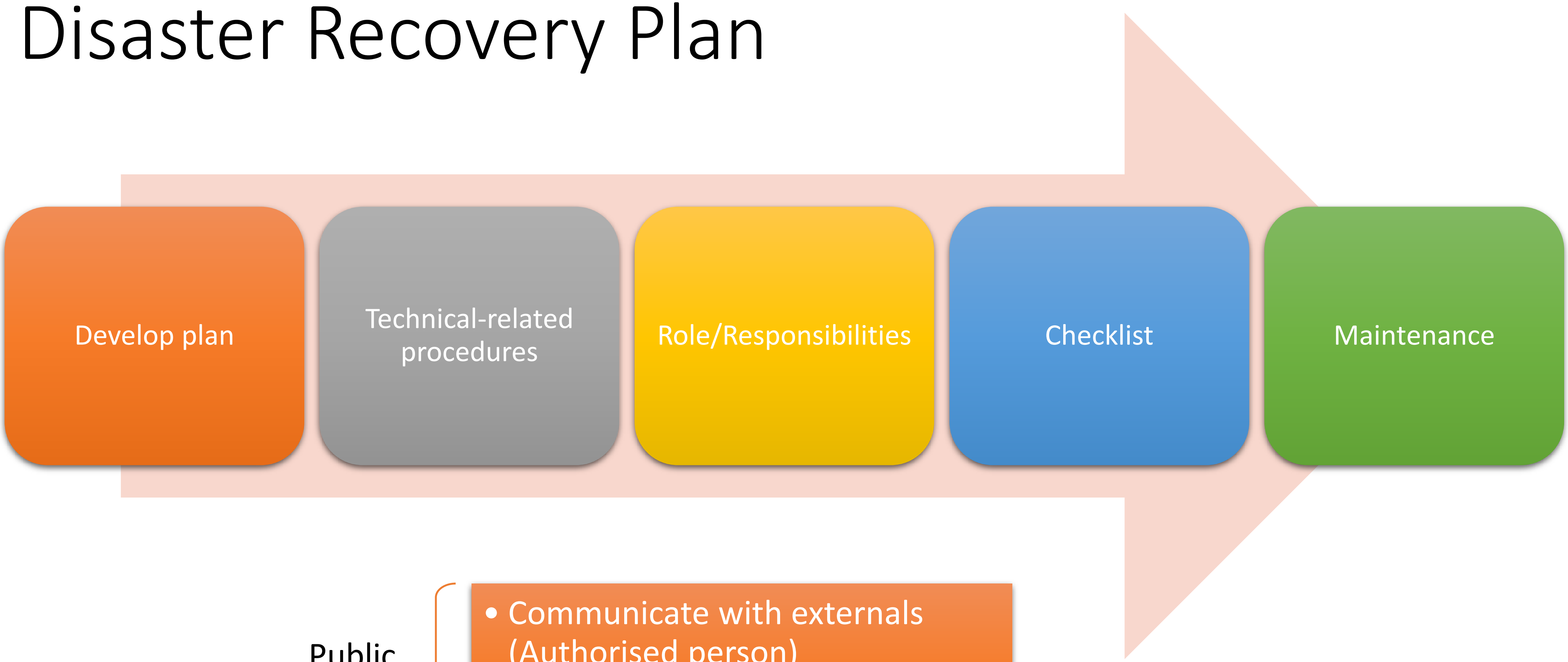
Maintenance

Annually

During Testing

Any Significant Change

Disaster Recovery Plan

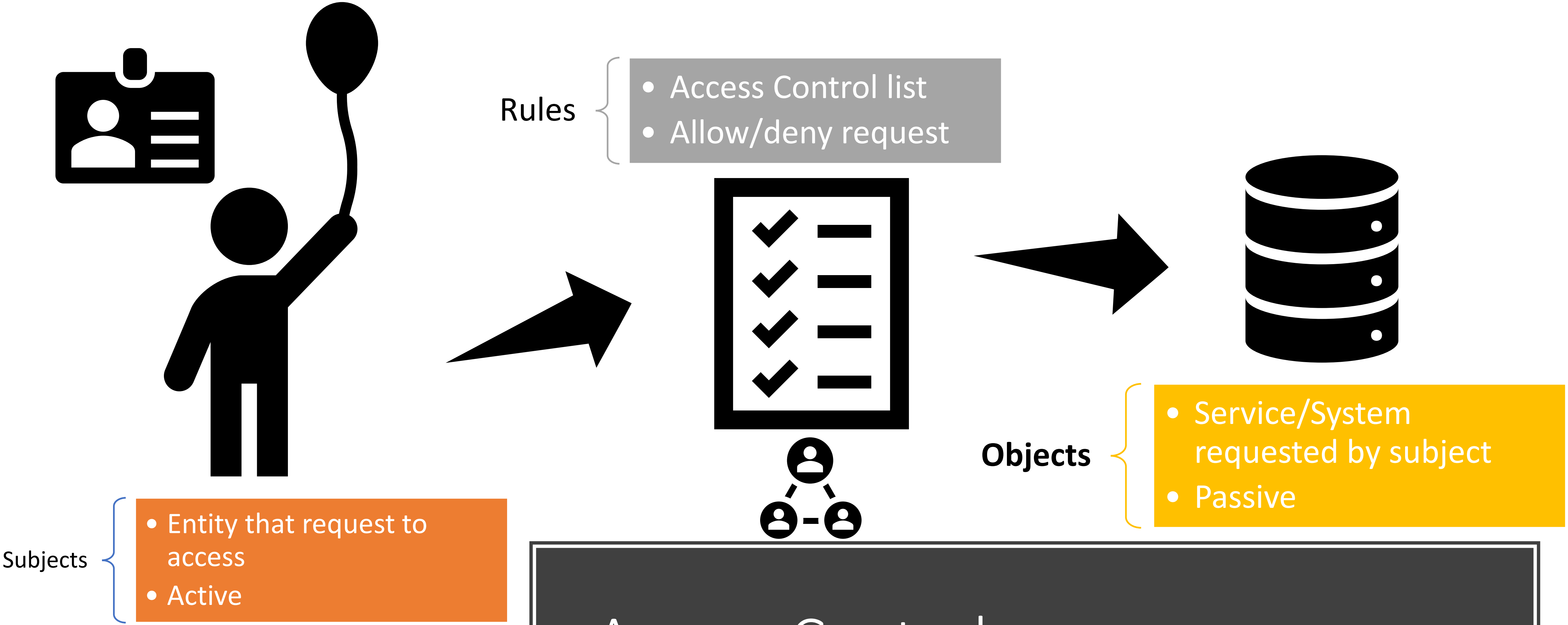


Public relation

- Communicate with externals (Authorised person)
- Contents will be decided by management

Checklist

- Will help prioritising step and procedures during crisis occurred



Rules
- Access Control list
- Allow/deny request

Subjects
- Entity that request to access
- Active

Objects
- Service/System requested by subject
- Passive

Access Control

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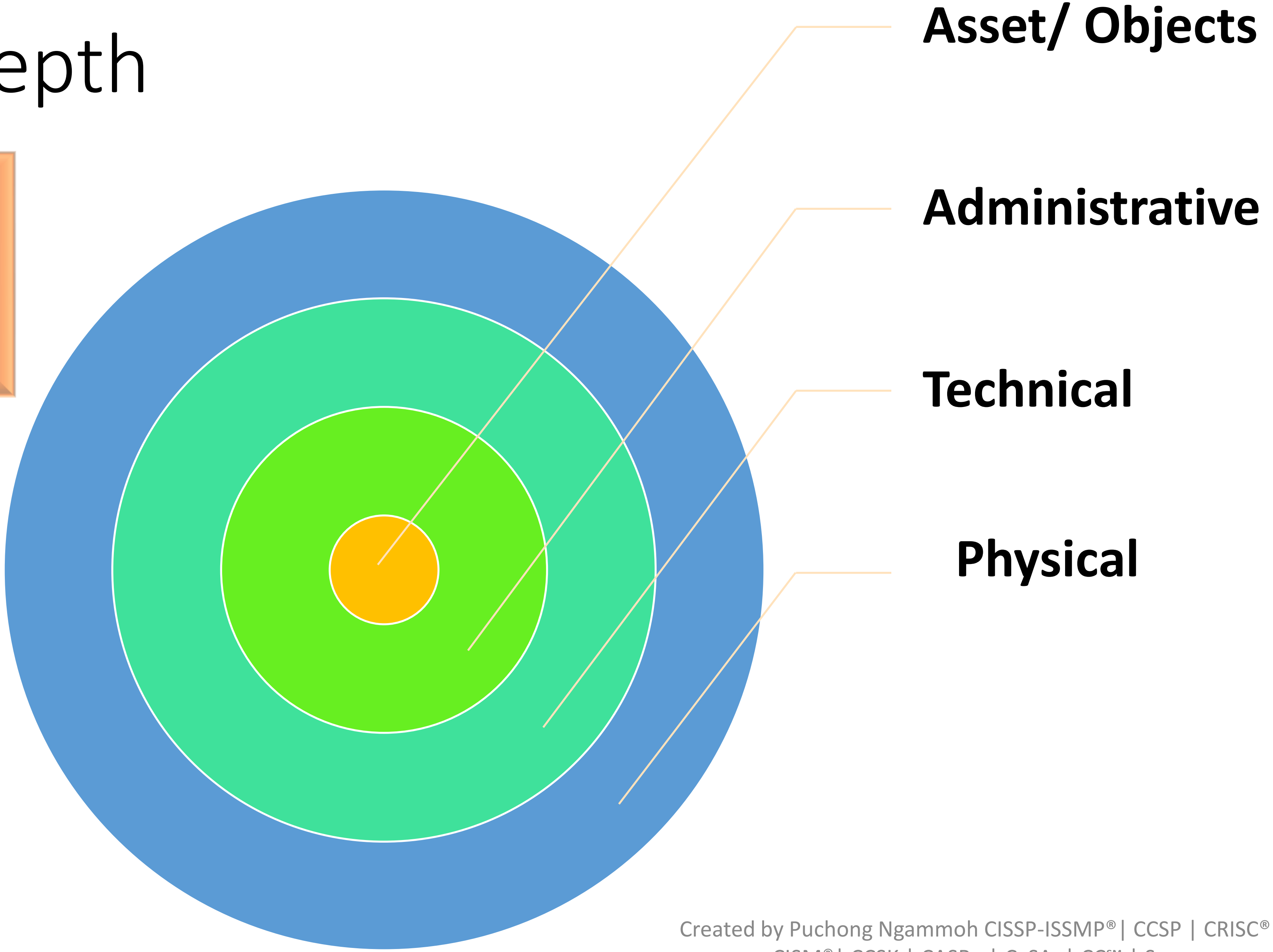
Defence in Depth

Multiple layers of controls for increasing security

Control Assessment – to measure the effectiveness of control (as intended)



Asset/ Objects

Administrative

Technical

Physical

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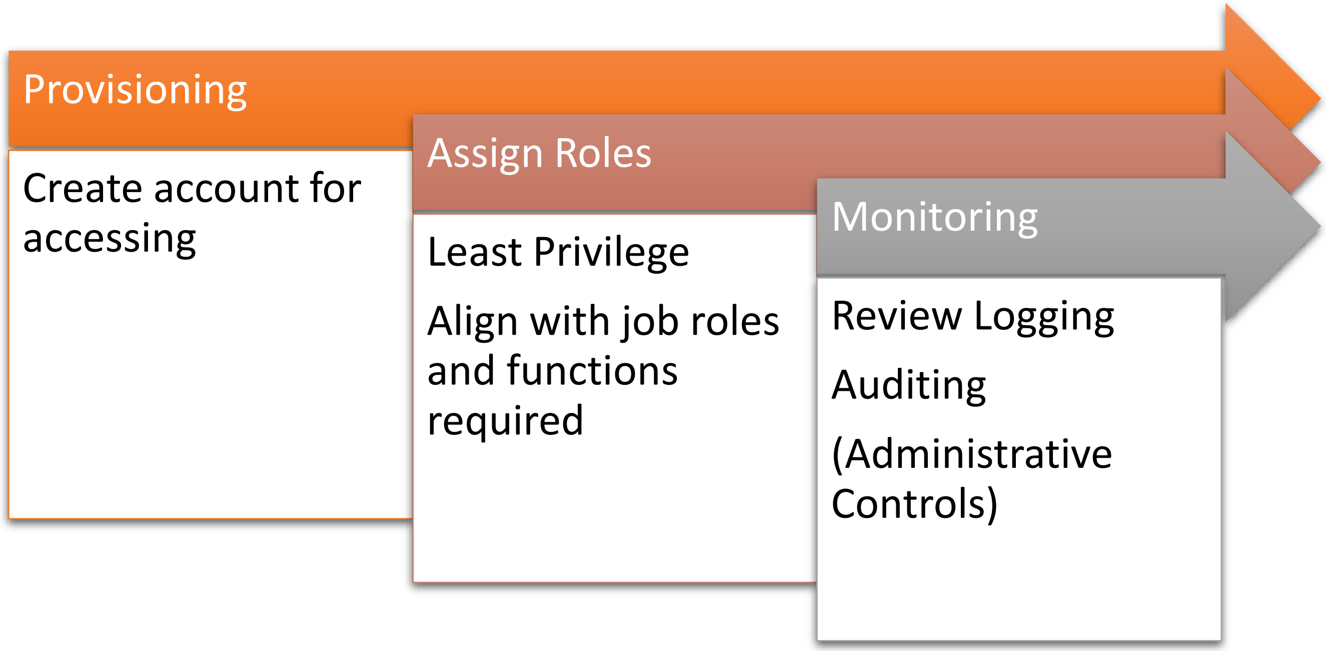
Privileged Access Management



Provisioning

Create account for accessing

Assign Roles

Least Privilege

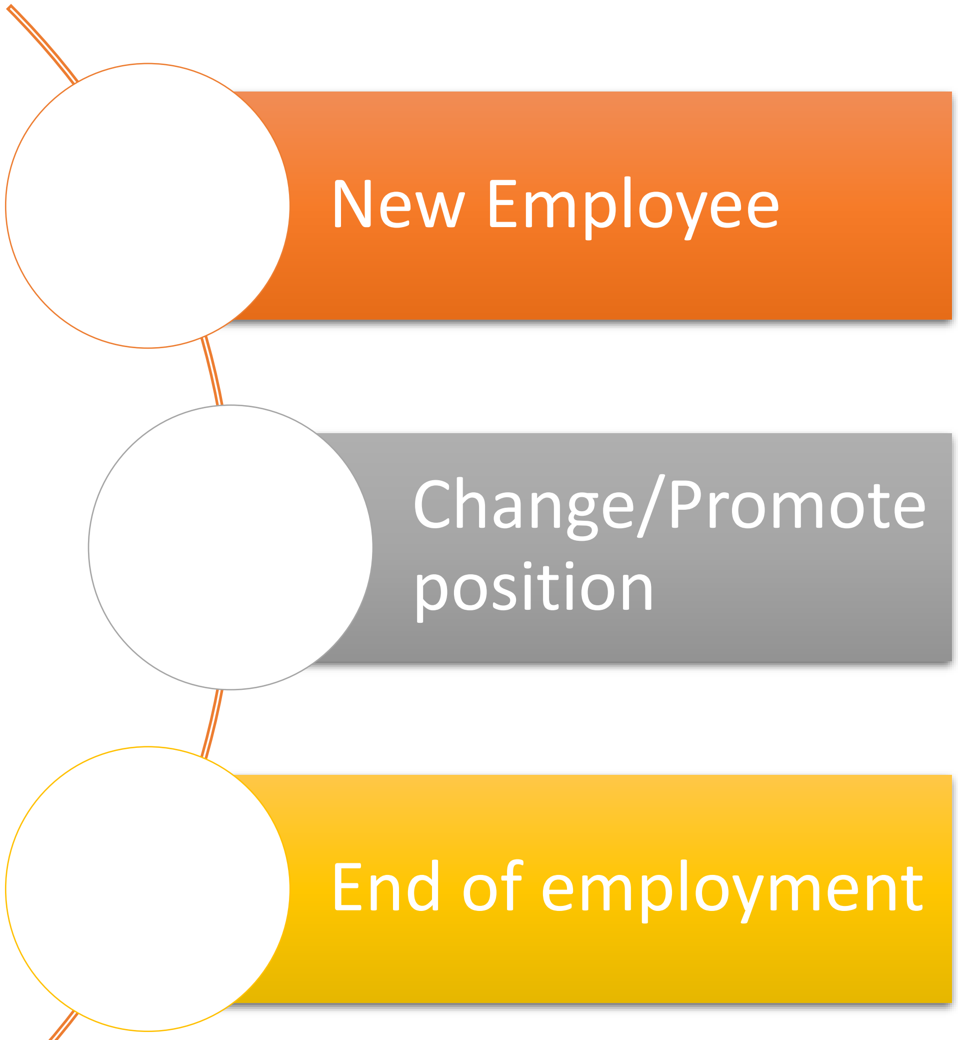
Align with job roles and functions required

Monitoring

Review Logging

Auditing

(Administrative Controls)



New Employee

Change/Promote position

End of employment

Segregation of Duties

- Separate related tasks and responsibilities

Two-person

- Prevent Frauds and insider threat
- High security task/area

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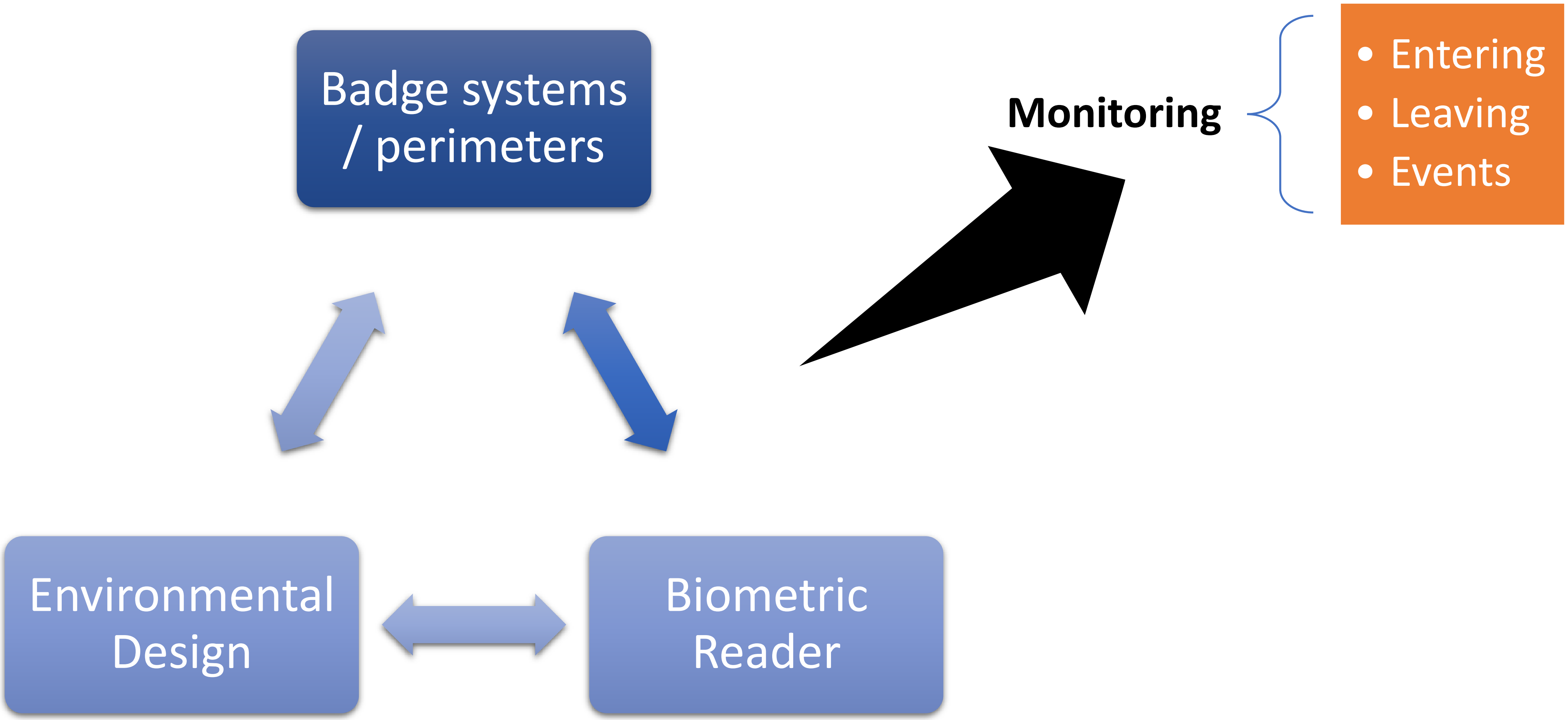
Access Control methods



Badge systems / perimeters

Environmental Design

Biometric Reader

Monitoring

- Entering
- Leaving
- Events

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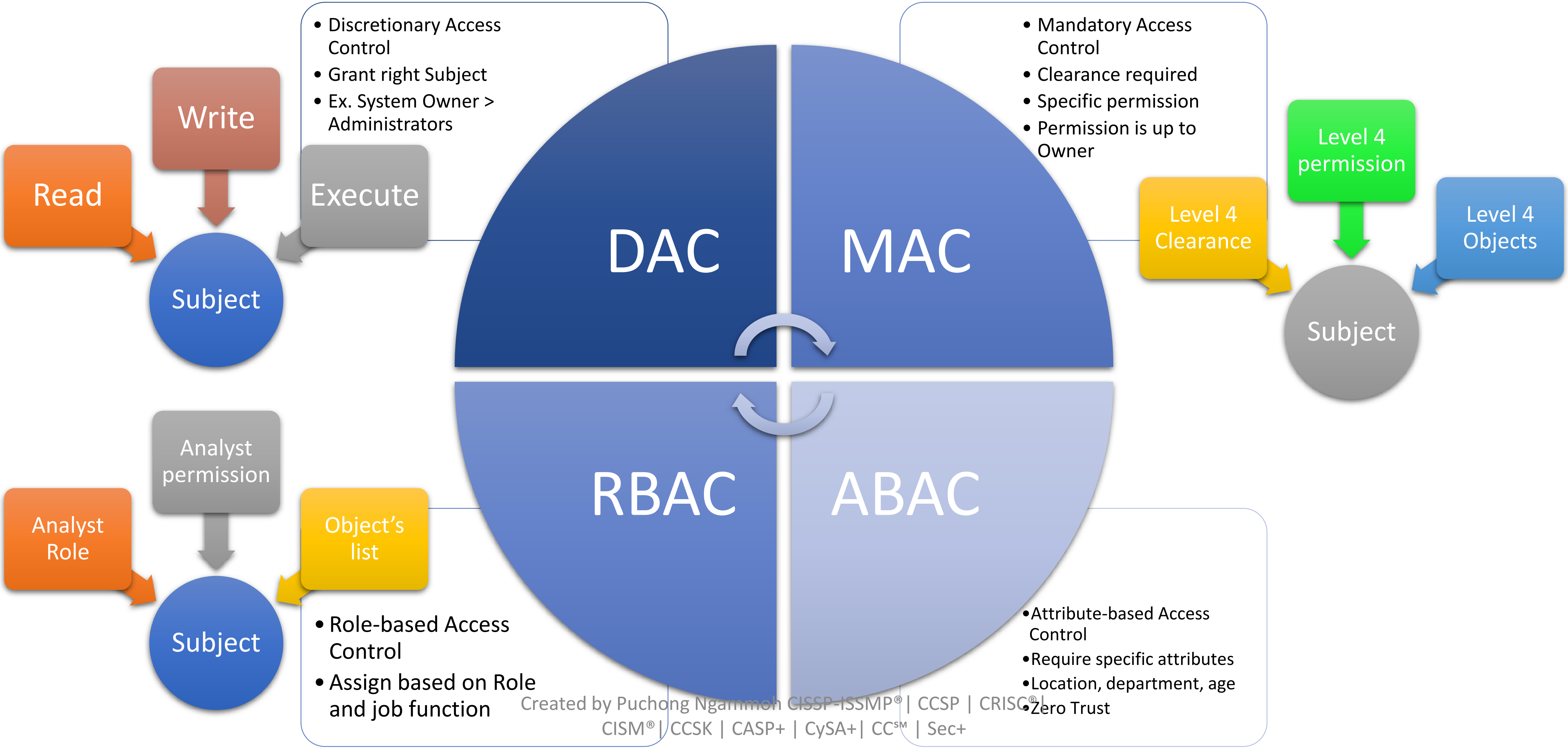
Access Control methods



- Discretionary Access Control
- Grant right Subject
- Ex. System Owner > Administrators

- Mandatory Access Control
- Clearance required
- Specific permission
- Permission is up to Owner

- Role-based Access Control
- Assign based on Role and job function

- Attribute-based Access Control
- Require specific attributes
- Location, department, age
- Zero Trust

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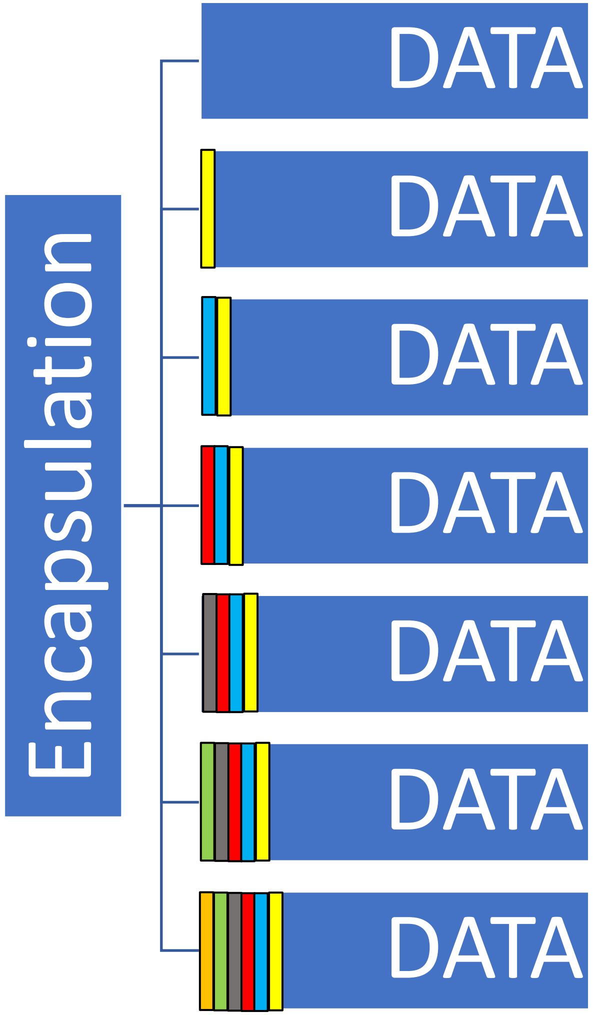
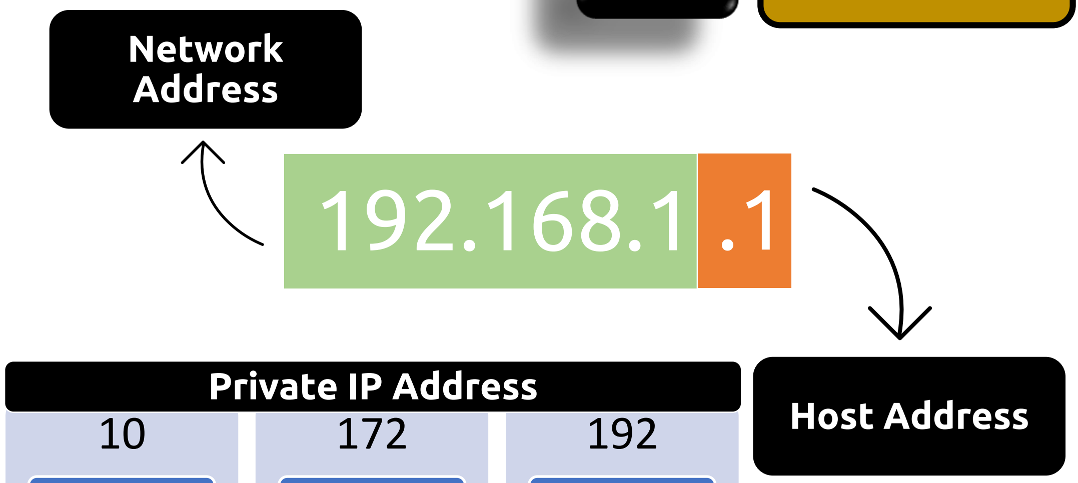
Domain 4 : Networking

TCP/IP	OSI	Network Layers
Application Layer	L7: Application	Data
	L6: Presentation	Picture (JPEG PNG)
	L5: Session	NetBIOS
Transport Layer	L4: Transport	TCP/UDP
Internet Layer	L3: Network	Packets
Network Interface Layer	L2: Data Link	Frames
	L1: Physical	Bits



2^{32} **IPV4**



Private IP Address

10	172	192
10.0.0.0	172.16.0.0	192.168.0.0
10.255.255.254	172.31.255.254	192.168.255.254

127.0.0.1 Loopback

fc00:: to fdff:ffff:ffff:ffff:ffff:ffff:ffff:ffff

Internal Address

2^{128} **IPV6**

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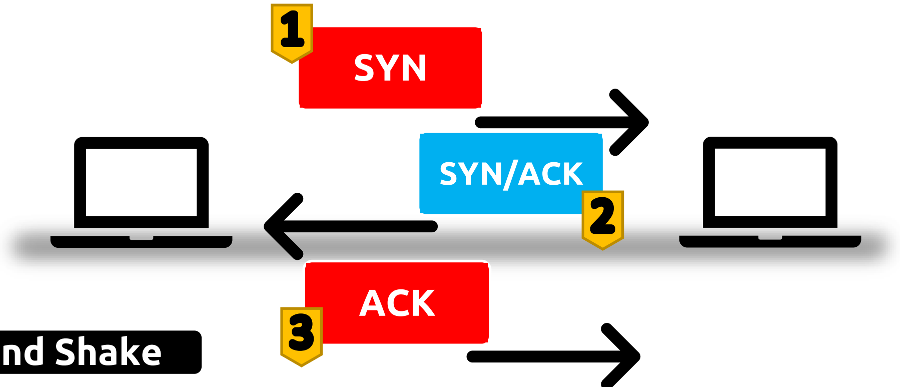
Port/Protocols

Physical Ports		
CAT5E	Fiber optic	CAT6
1 (Mbit/s)	1	1
100 MHz	10 Gbps	250 MHz

Logical Ports		
Well-known	Registered	Dynamic/Private
0	1024	49152
1023	49151	65535

21	FTP	22	SFTP
23	Telnet	22	SSH
25	SMTP	587	SMTP
37	Time	123	NTP
53	DNS	853	DoT
80	HTTP	443	HTTPS
161	SNMP	161	SNMP
445	SMB	2049	NFS
389	LDAP	636	LDAPS



3 ways Hand Shake

Wireless Network Threat

- Man in The Middle
- Fragment Attacks
- Oversized Packet Attacks
- Spoofing Attacks
- DOS/DDOS

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Cyber Threat

- Spoofing
- Phishing
- DOS/DDOS
- Virus
- Worm
- Trojan
- On-path
- Side-Channel
- APT
- Insider Threat
- Ransomware

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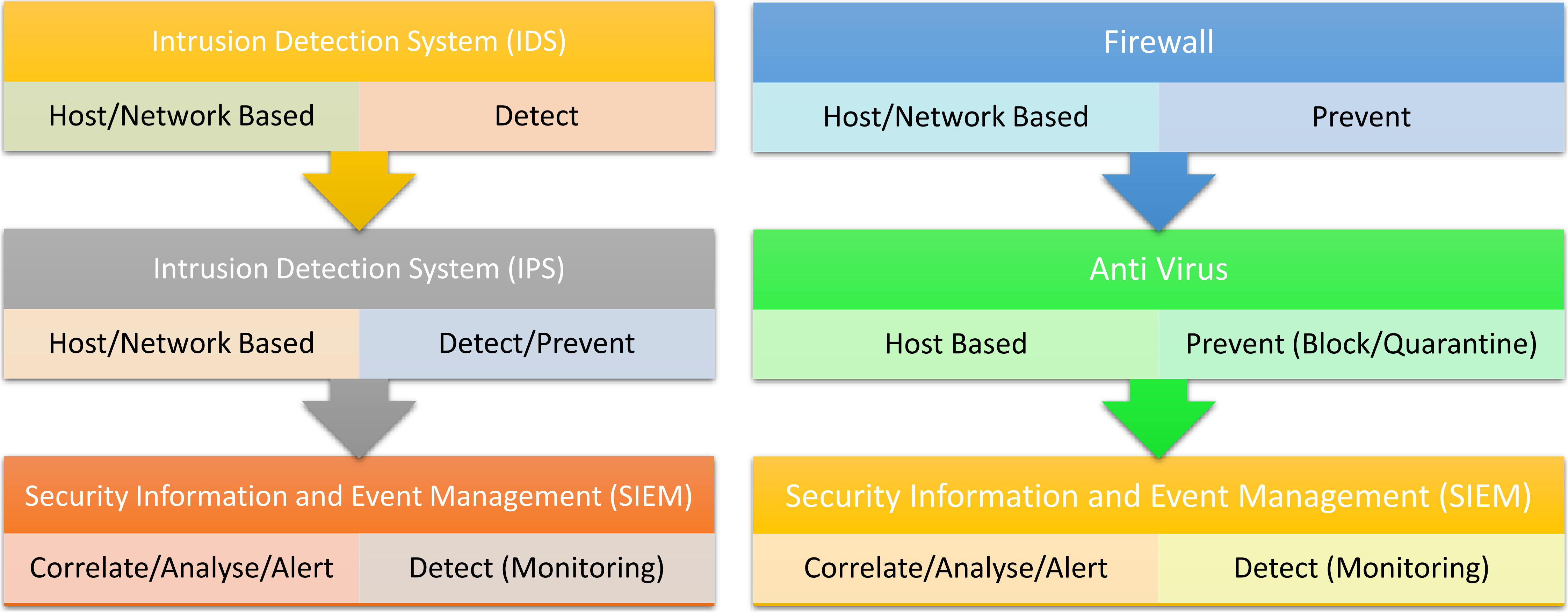
Preventing/Detecting Threats



Intrusion Detection System (IDS)

Host/Network Based | Detect

Intrusion Detection System (IPS)

Host/Network Based | Detect/Prevent

Security Information and Event Management (SIEM)

Correlate/Analyse/Alert | Detect (Monitoring)

Firewall

Host/Network Based | Prevent

Anti Virus

Host Based | Prevent (Block/Quarantine)

Security Information and Event Management (SIEM)

Correlate/Analyse/Alert | Detect (Monitoring)

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Data Centre Components

Closets

(Server/Network Connection / Wiring / Network devices)

HVAC

(64-81 F, Humidity 40-60%)

Power

Fire Suppression

Redundancy

(UPS / Generator)

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Cloud Computing

Broad Network Access

- Access from anywhere with internet connection

Rapid Elasticity

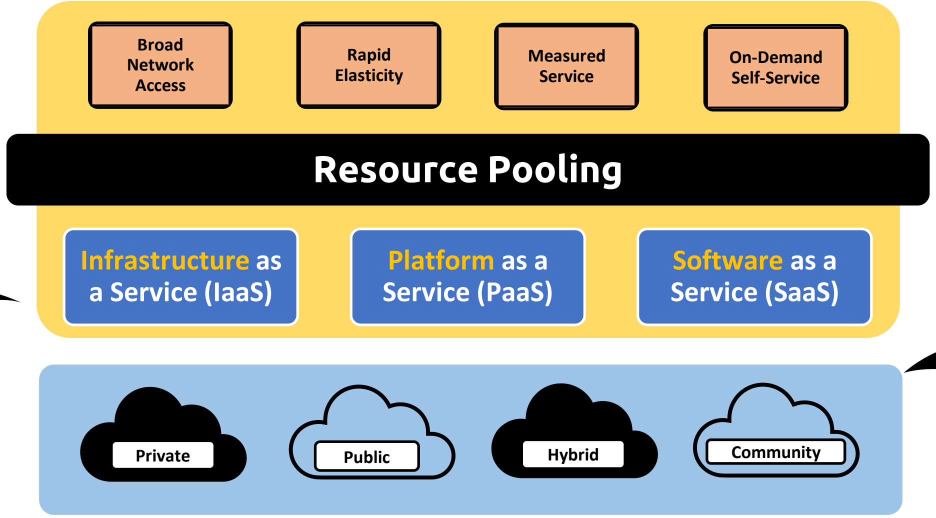
- Scale up/down based on demands

Measured Service

- Pay as you go

On-Demand Self-Service

- Manage without contacting vendors



Infrastructure as a Service (IaaS)

- CSC Manage the most of components

Platform as a Service (PaaS)

- CSP provide Underlying OS components

Software as a Service (SaaS)

- CSP manage most of the components

Private Cloud

- Solely own by one organisation using own resources

Public Cloud

- Shared resources with other tenants

Hybrid Cloud

- Combination of one or more cloud deployments

Community Cloud

- Affinity Group on same objectives

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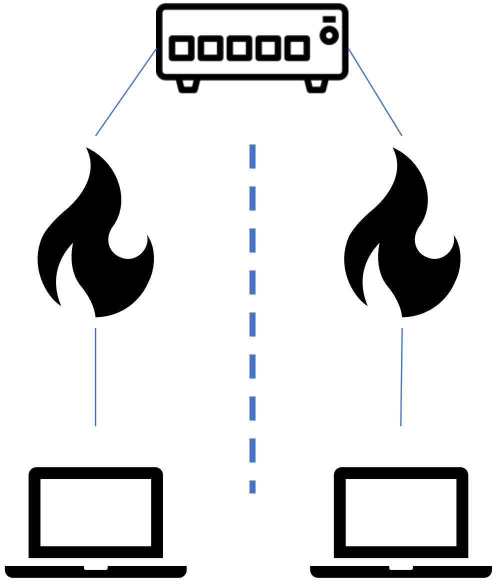
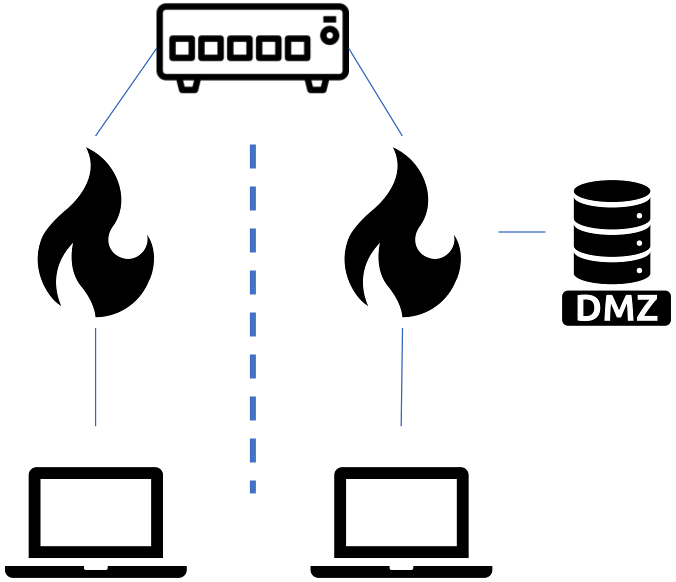
Network Designing



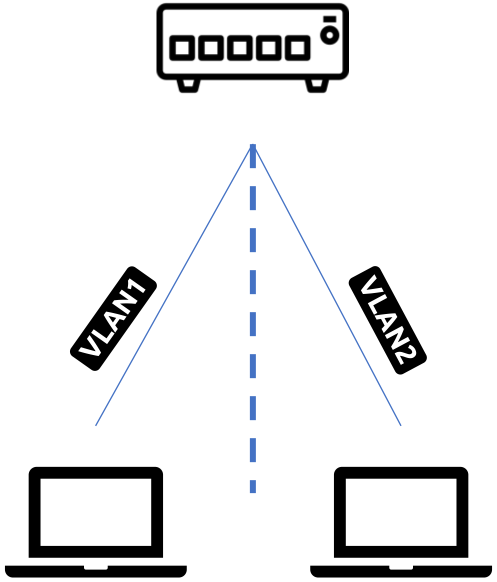
Network Segmentation

Isolated from all outside communications



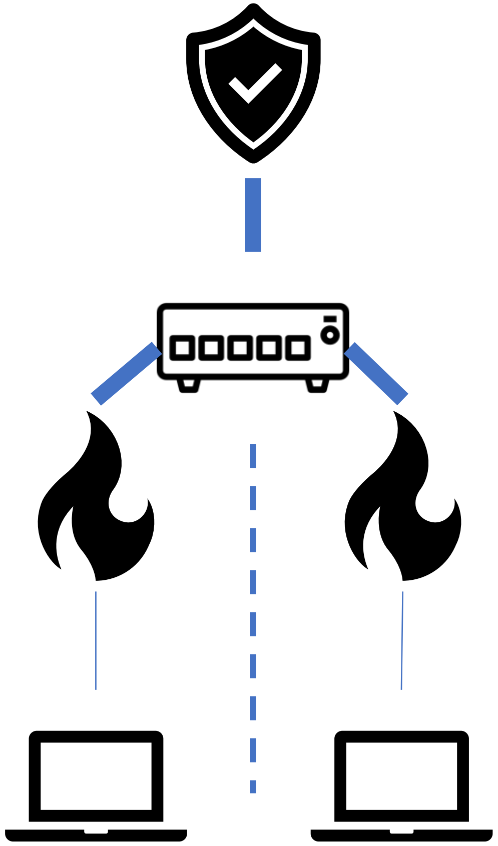
Demilitarised Zone (DMZ)

Isolated internet-facing zone



Virtual Local Area Network (VLAN)

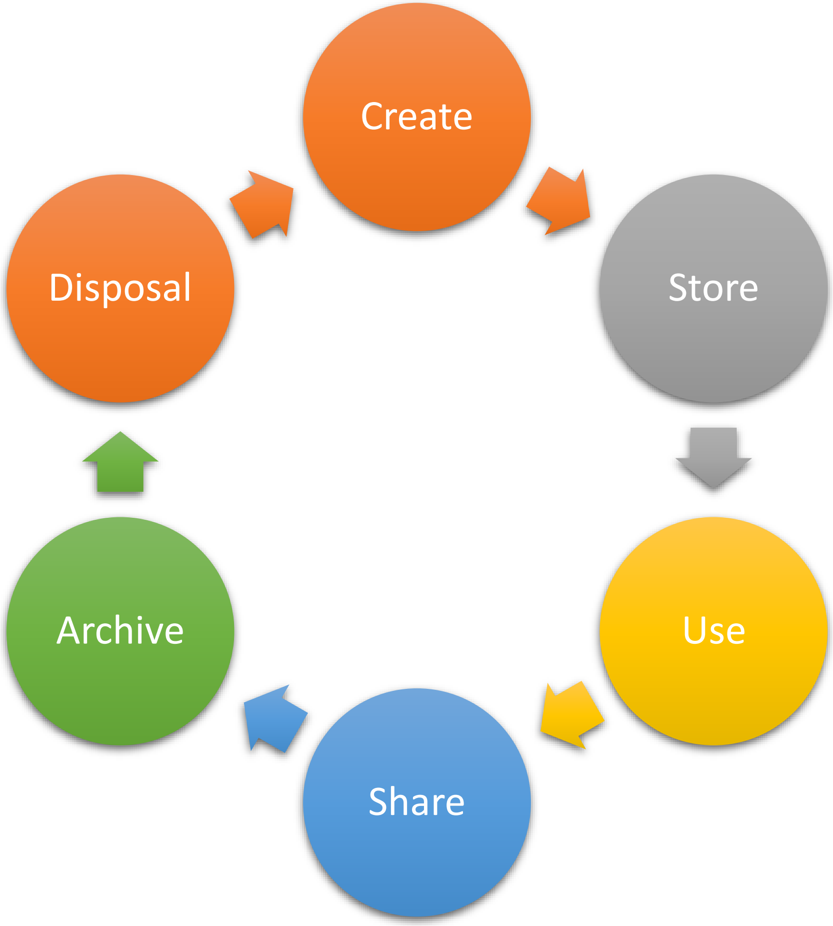
Isolated internal network



Virtual Private Network (VPN)

Secure communication in transit

Data Life cycle



Create

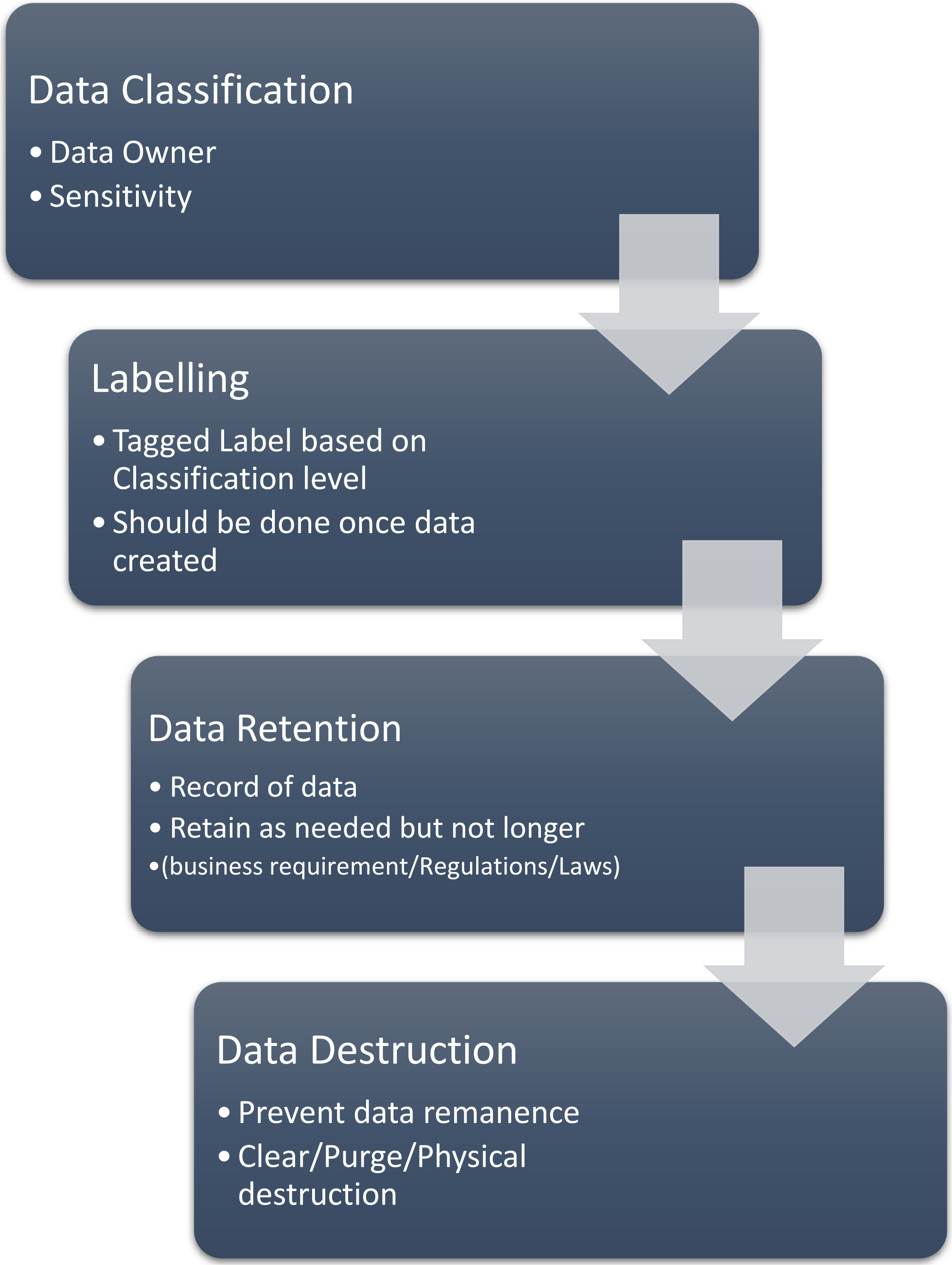
Store

Use

Share

Archive

Disposal



Data Classification

- Data Owner
- Sensitivity

Labelling

- Tagged Label based on Classification level
- Should be done once data created

Data Retention

- Record of data
- Retain as needed but not longer
- (business requirement/Regulations/Laws)

Data Destruction

- Prevent data remanence
- Clear/Purge/Physical destruction

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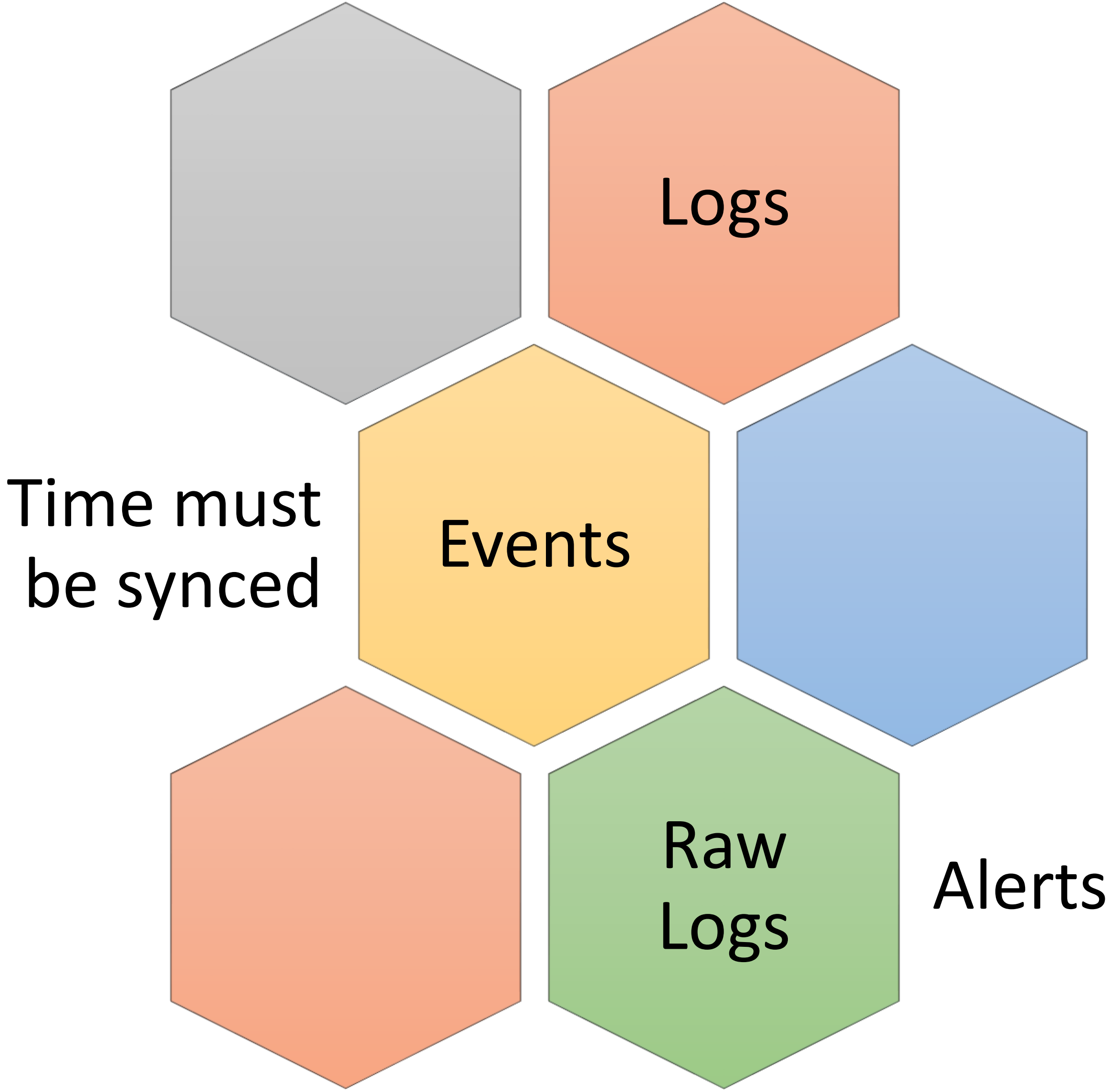
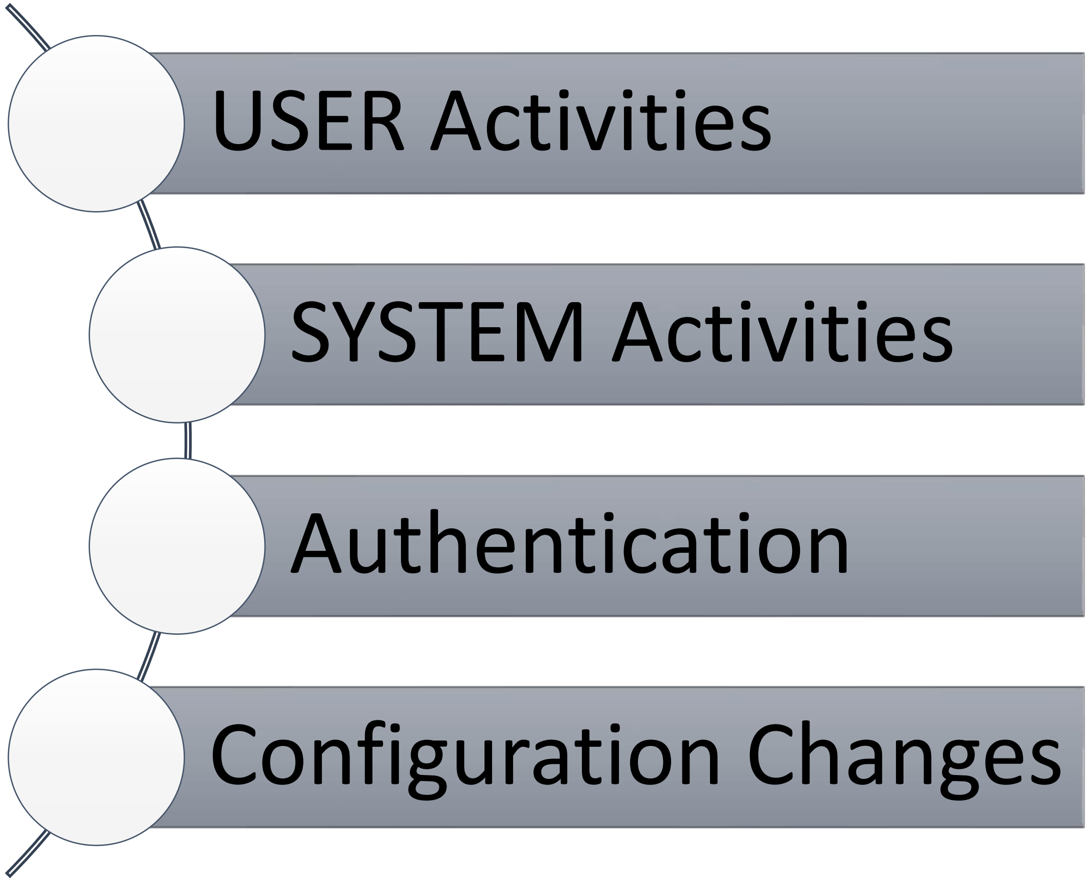
Logging and Monitoring





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Common Log Sources

- Firewall
- Network Devices
- IDS/IPS
- Anti Malware
- Proxy
- Threat Intelligence Feeds

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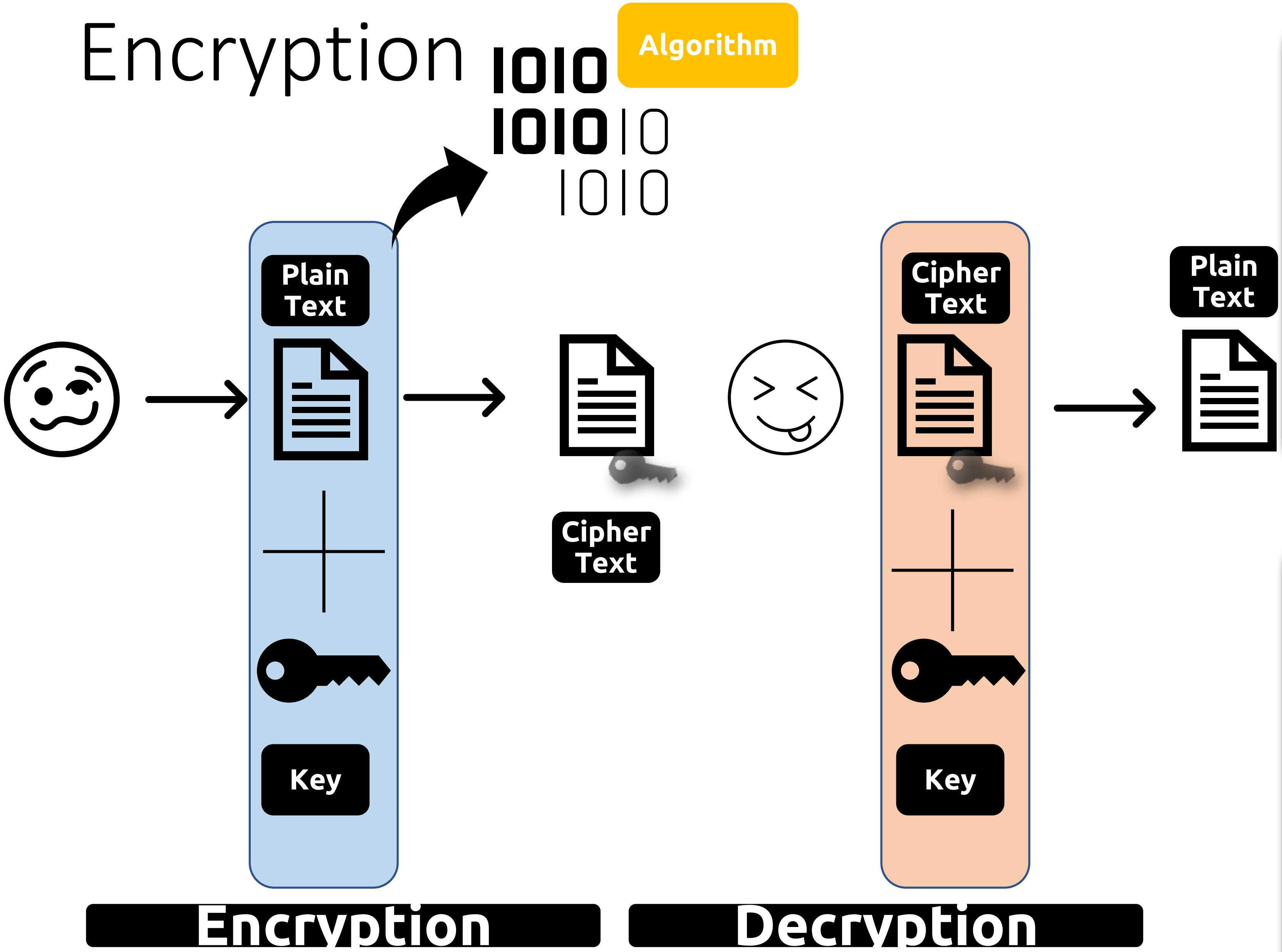
Encryption



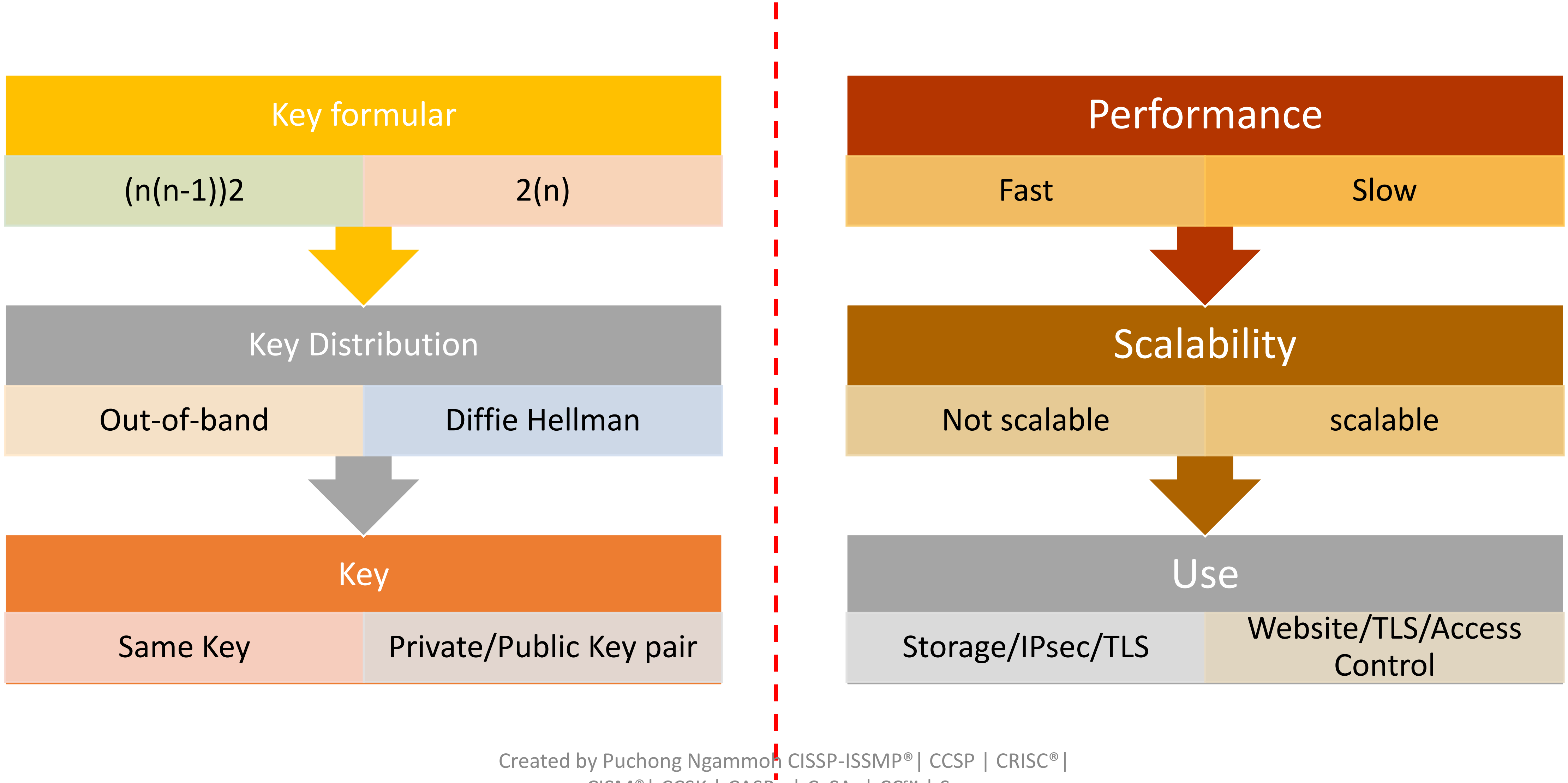
Hashing

- 1-way
- Integrity Check
- Ensure that message is not altered

Digital Signature

- Authenticity
- Non-repudiation
- Sign with private key of sender

Symmetric / Asymmetric



Key formular

(n(n-1))2 | 2(n)

Key Distribution

Out-of-band | Diffie Hellman

Key

Same Key | Private/Public Key pair

Performance

Fast | Slow

Scalability

Not scalable | scalable

Use

Storage/IPsec/TLS | Website/TLS/Access Control

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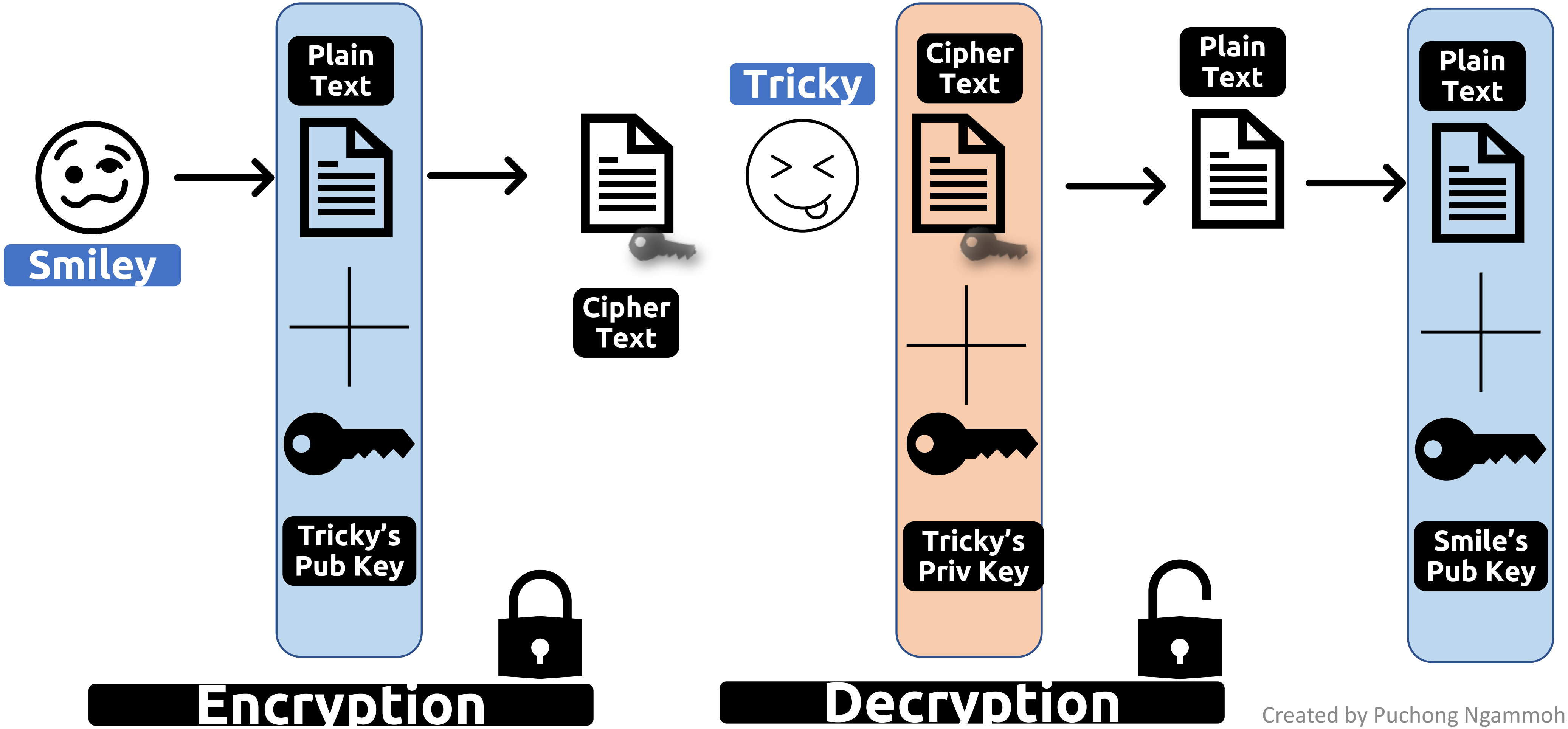
Asymmetric Encryption



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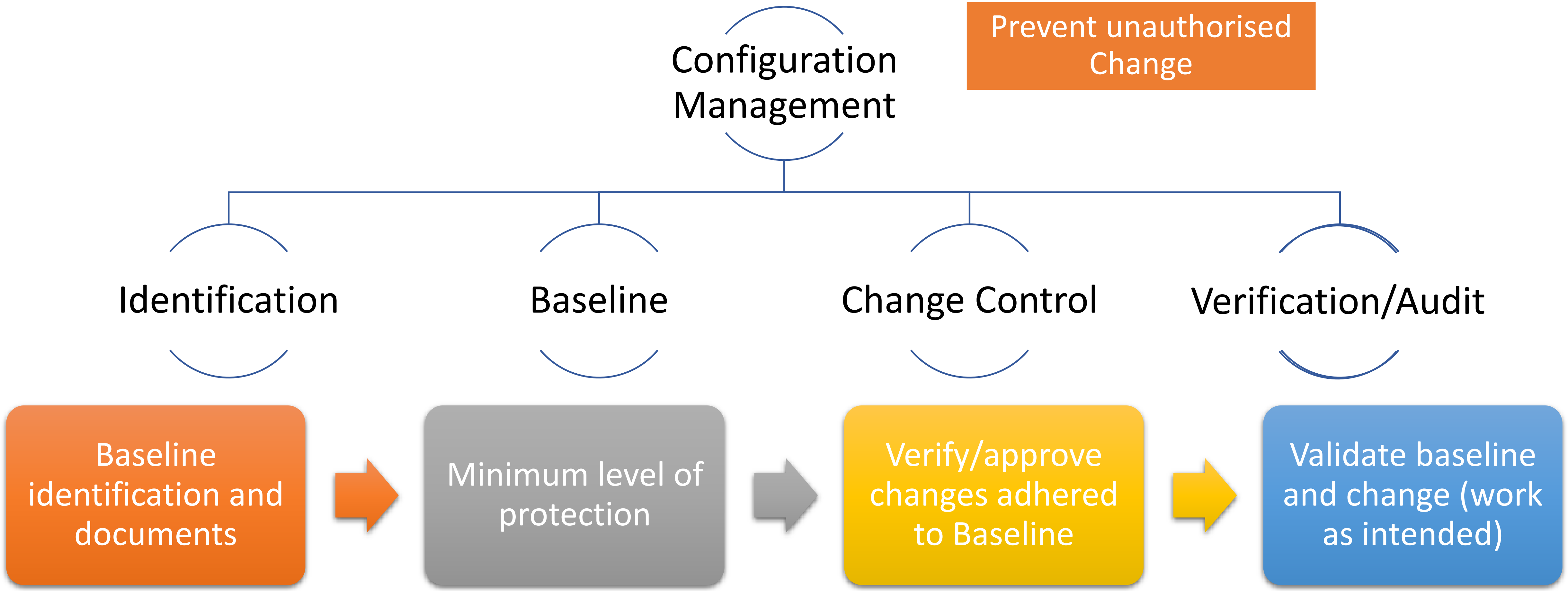
System Hardening



Configuration Management

Prevent unauthorised Change

Identification

Baseline

Change Control

Verification/Audit

Baseline identification and documents

Minimum level of protection

Verify/approve changes adhered to Baseline

Validate baseline and change (work as intended)

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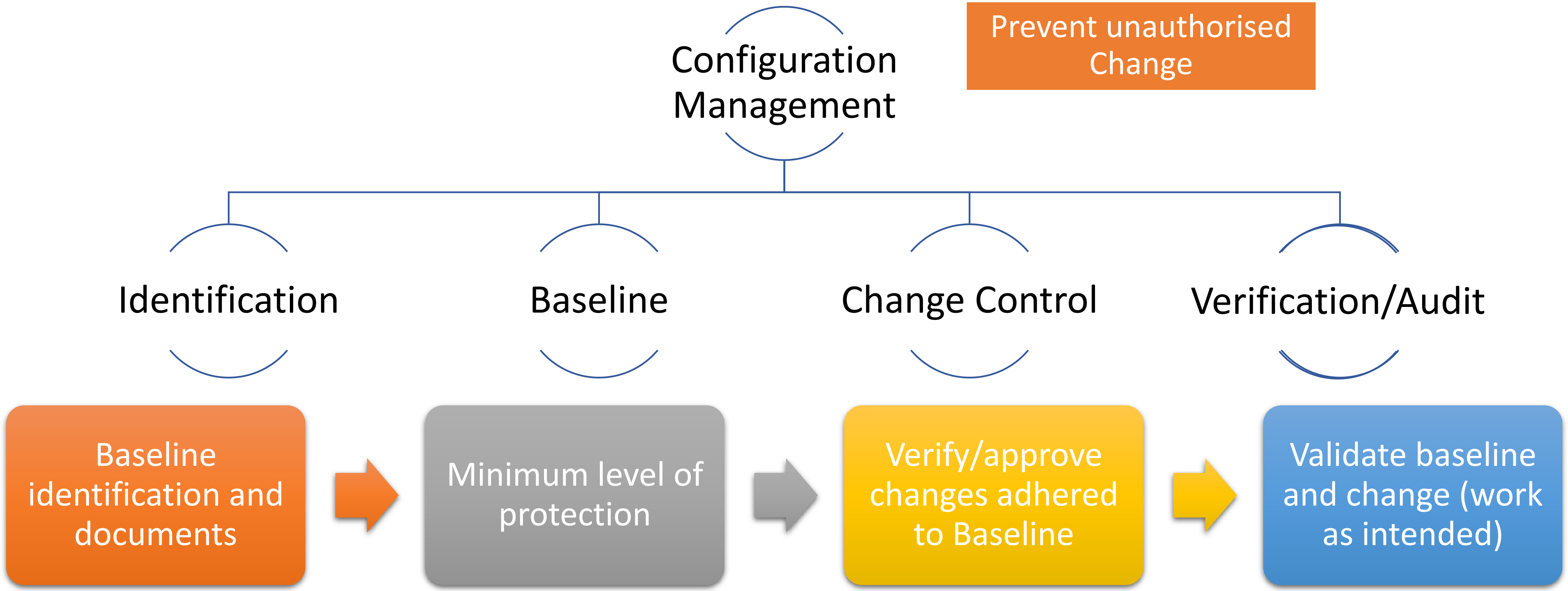
System Hardening



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Validate baseline and change (work as intended)

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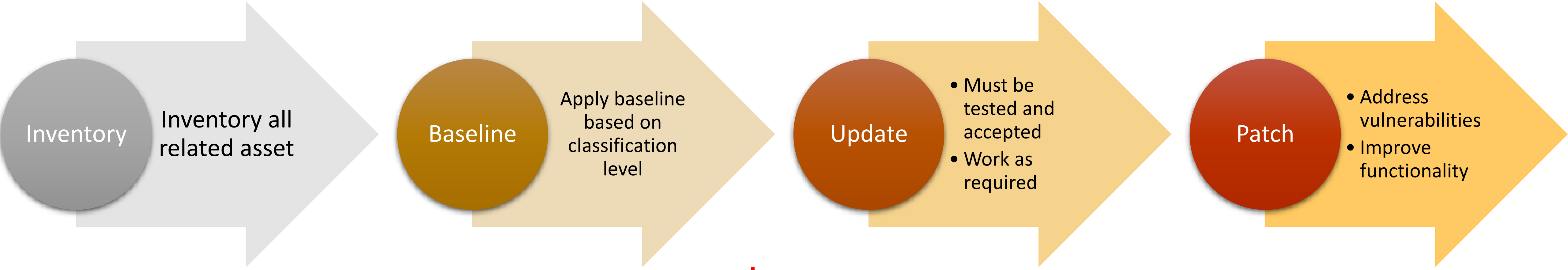
Change Management Overview



Inventory

Inventory all related asset

Baseline

Apply baseline based on classification level

Update

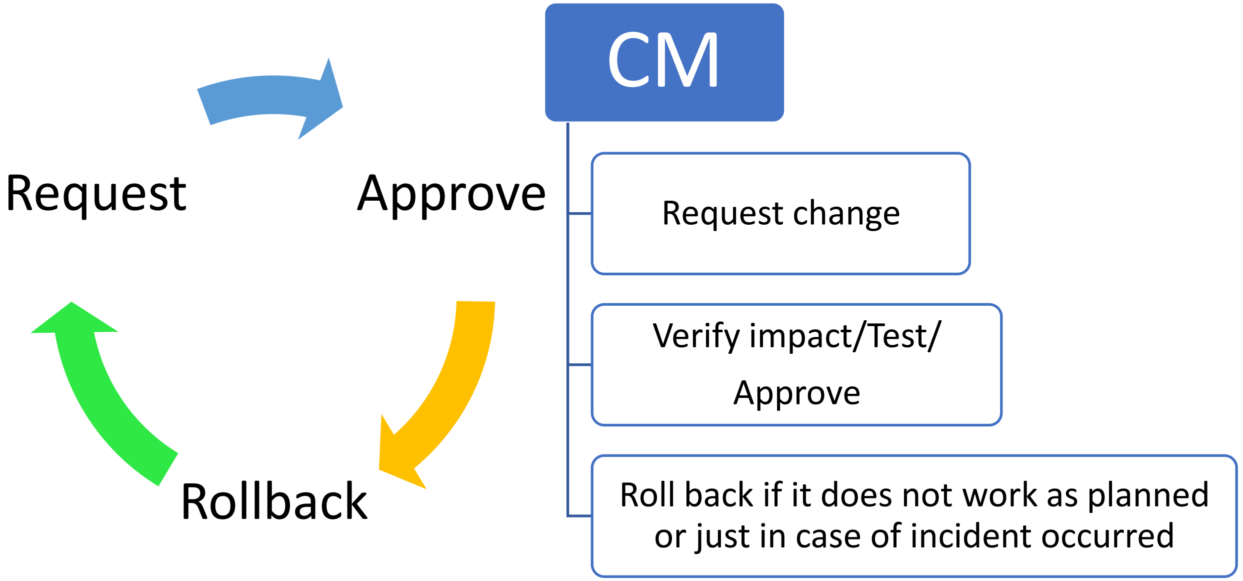
- Must be tested and accepted
- Work as required

Patch

- Address vulnerabilities
- Improve functionality

Common organisational policies

- Data Handling Policy
- Password Policy
- Acceptable Use Policy
- BYOD
- Privacy Policy
- Change management Policy



Request

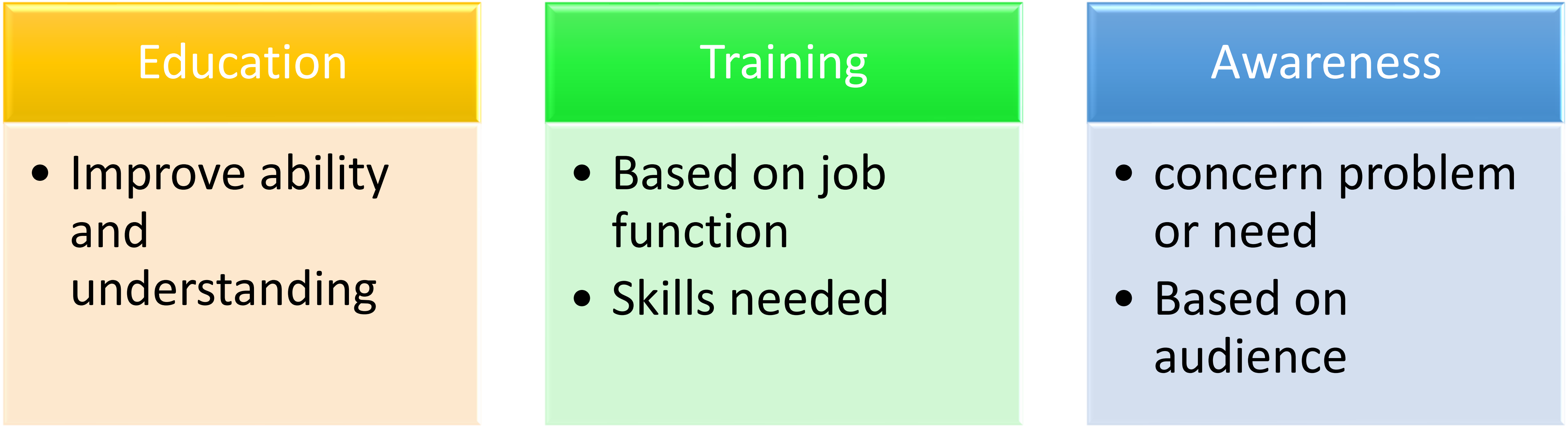
Approve

Rollback

CM

- Request change
- Verify impact/Test/ Approve
- Roll back if it does not work as planned or just in case of incident occurred

Security Awareness



Education

- Improve ability and understanding

Training

- Based on job function
- Skills needed

Awareness

- concern problem or need
- Based on audience

To ensure understanding of individual expectation based on “Role and Responsibilities”

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