Framework for Improving Critical Infrastructure Cybersecurity

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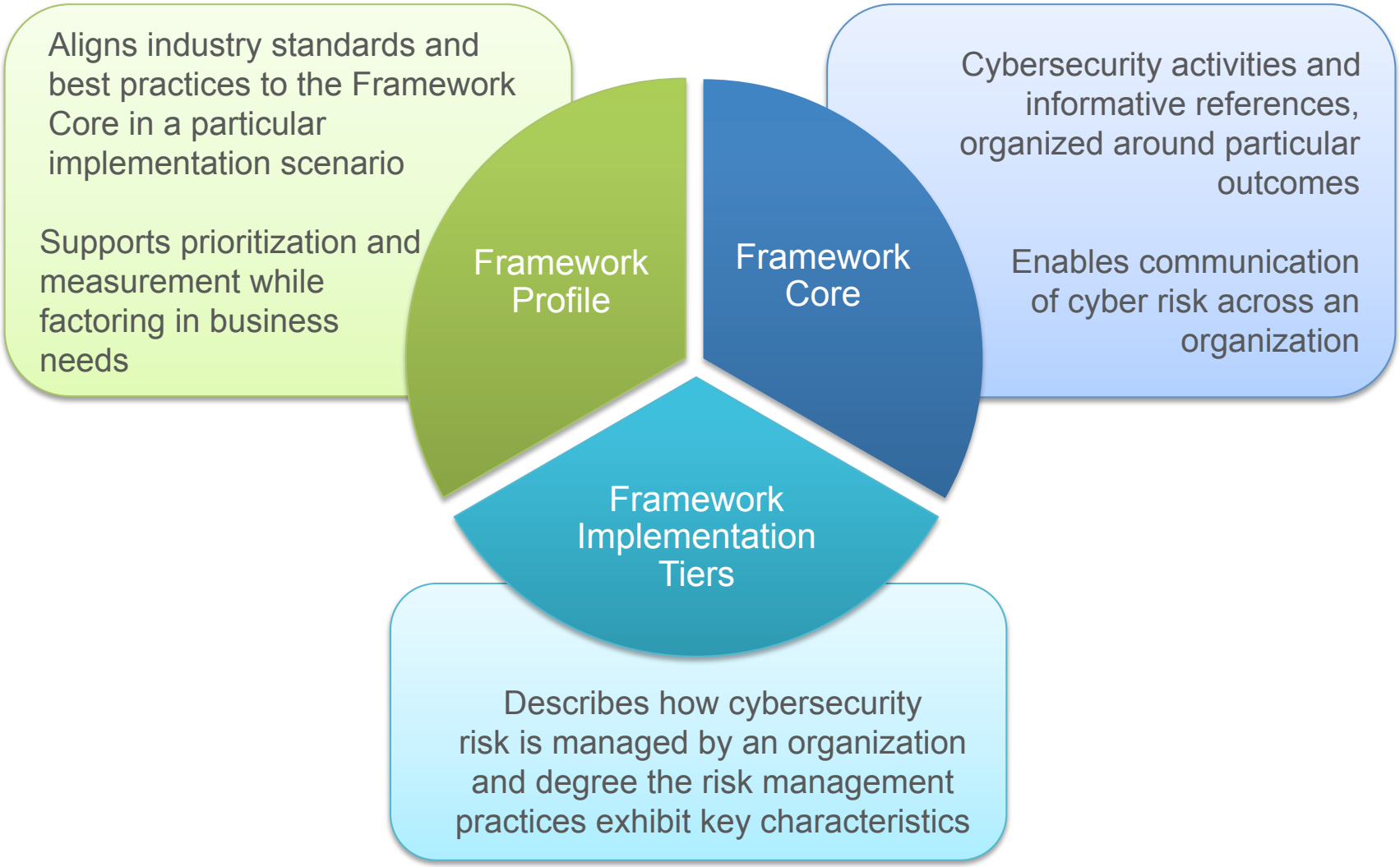
NIST
National Institute of Standards and Technology
U.S. Department of Commerce

Improving Critical Infrastructure Cybersecurity

"It is the policy of the United States to enhance the security and resilience of the Nation's critical infrastructure and to maintain a cyber environment that encourages efficiency, innovation, and economic prosperity while promoting safety, security, business confidentiality, privacy, and civil liberties"

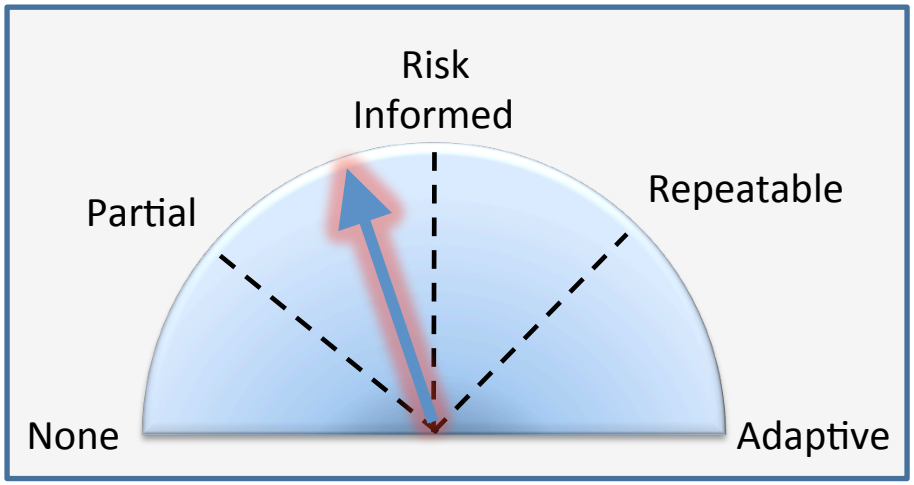
President Barack Obama
Executive Order 13636, 12 February 2013

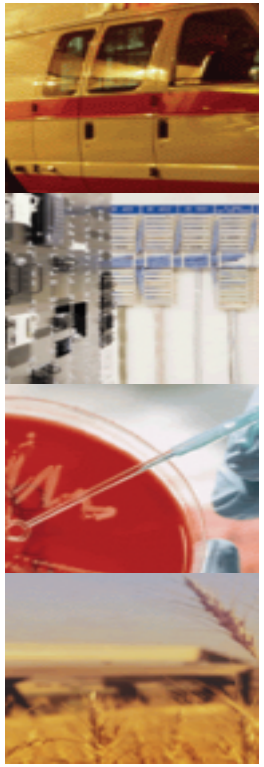
Cybersecurity Framework Components



Implementation Tiers

Cybersecurity Framework Component





- Allow for flexibility in implementation and bring in concepts of maturity models
- Reflect how an organization implements the Framework Core functions and manages its risk
- Progressive, ranging from Partial (Tier 1) to Adaptive (Tier 4), with each Tier building on the previous Tier
- Characteristics are defined at the organizational level and are applied to the Framework Core to determine how a category is implemented.

Core

Cybersecurity Framework Component

Function	Category	ID
Identify	Asset Management	ID.AM
	Business Environment	ID.BE
	Governance	ID.GV
	Risk Assessment	ID.RA
	Risk Management Strategy	ID.RM
Protect	Access Control	PR.AC
	Awareness and Training	PR.AT
	Data Security	PR.DS
	Information Protection Processes & Procedures	PR.IP
	Maintenance	PR.MA
	Protective Technology	PR.PT
Detect	Anomalies and Events	DE.AE
	Security Continuous Monitoring	DE.CM
	Detection Processes	DE.DP
Respond	Response Planning	RS.RP
	Communications	RS.CO
	Analysis	RS.AN
	Mitigation	RS.MI
	Improvements	RS.IM
Recover	Recovery Planning	RC.RP
	Improvements	RC.IM
	Communications	RC.CO

Subcategory	Informative References
ID.BE-1: The organization's role in the supply chain is identified and communicated	COBIT 5 APO01.02, DSS06.03 ISA 62443-2-1:2009 4.3.2.3.3 ISO/IEC 27001:2013 A.6.1.1 NIST SP 800-53 Rev. 4 CP-2, PS-7, PM-11
ID.BE-2: The organization's place in critical infrastructure and its industry sector is identified and communicated	COBIT 5 APO08.04, APO08.05, APO10.03, APO10.04, APO10.05 ISO/IEC 27001:2013 A.15.1.3, A. 15.2.1, A.15.2.2 NIST SP 800-53 Rev. 4 CP-2, SA-12
ID.BE-3: Priorities for organizational mission, objectives, and activities are established and communicated	COBIT 5 APO02.06, APO03.01 NIST SP 800-53 Rev. 4 PM-8
ID.BE-4: Dependencies and critical functions for delivery of critical services are established	COBIT 5 APO02.01, APO02.06, APO03.01 ISA 62443-2-1:2009 4.2.2.1, 4.2.3.6 NIST SP 800-53 Rev. 4 PM-11, SA-14
ID.BE-5: Resilience requirements to support delivery of critical services are established	ISO/IEC 27001:2013 A.11.2.2, A. 11.2.3, A.12.1.3 NIST SP 800-53 Rev. 4 CP-8, PE-9, PE-11, PM-8, SA-14

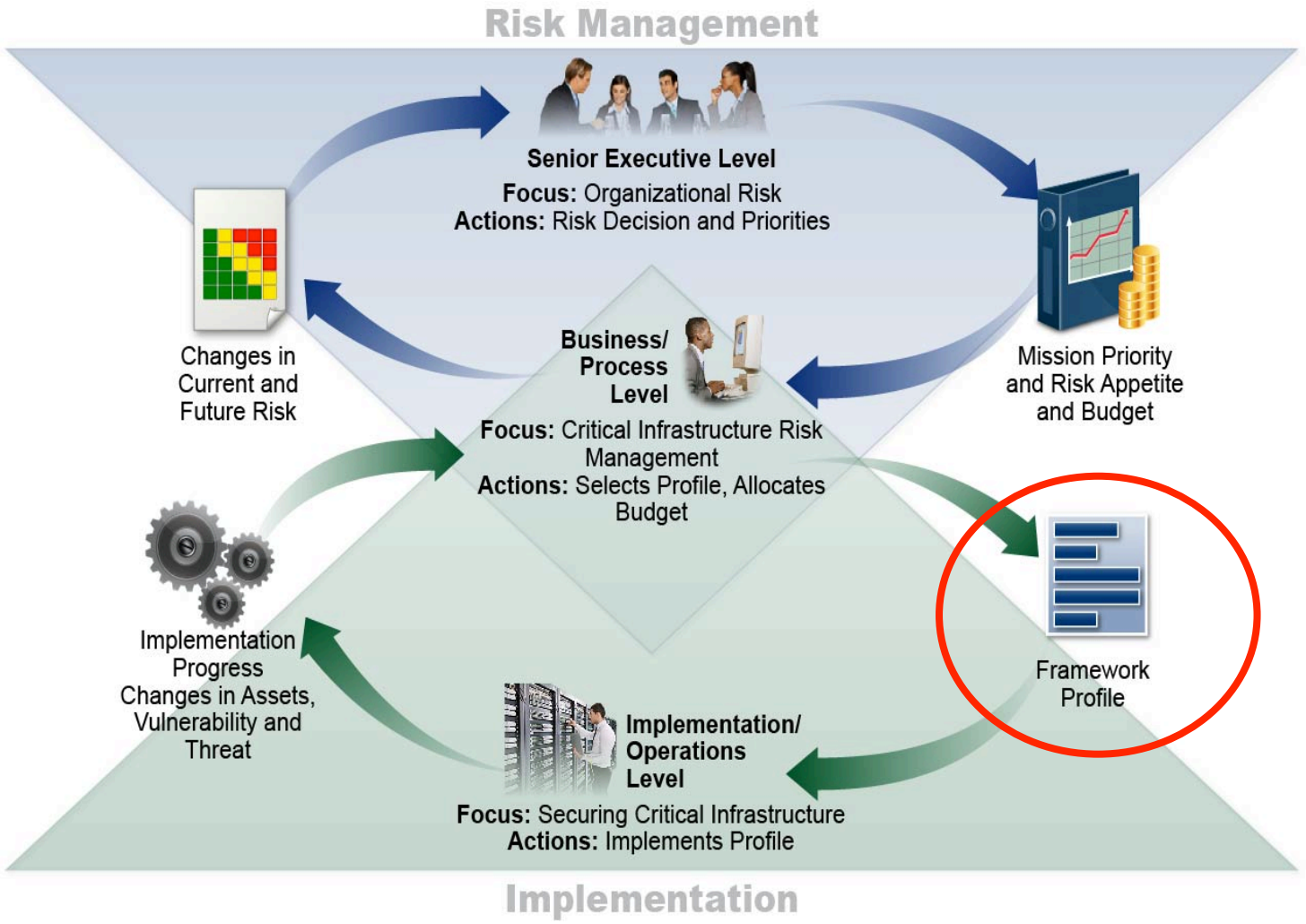
Profile

Cybersecurity Framework Component

Ways to think about a Profile:

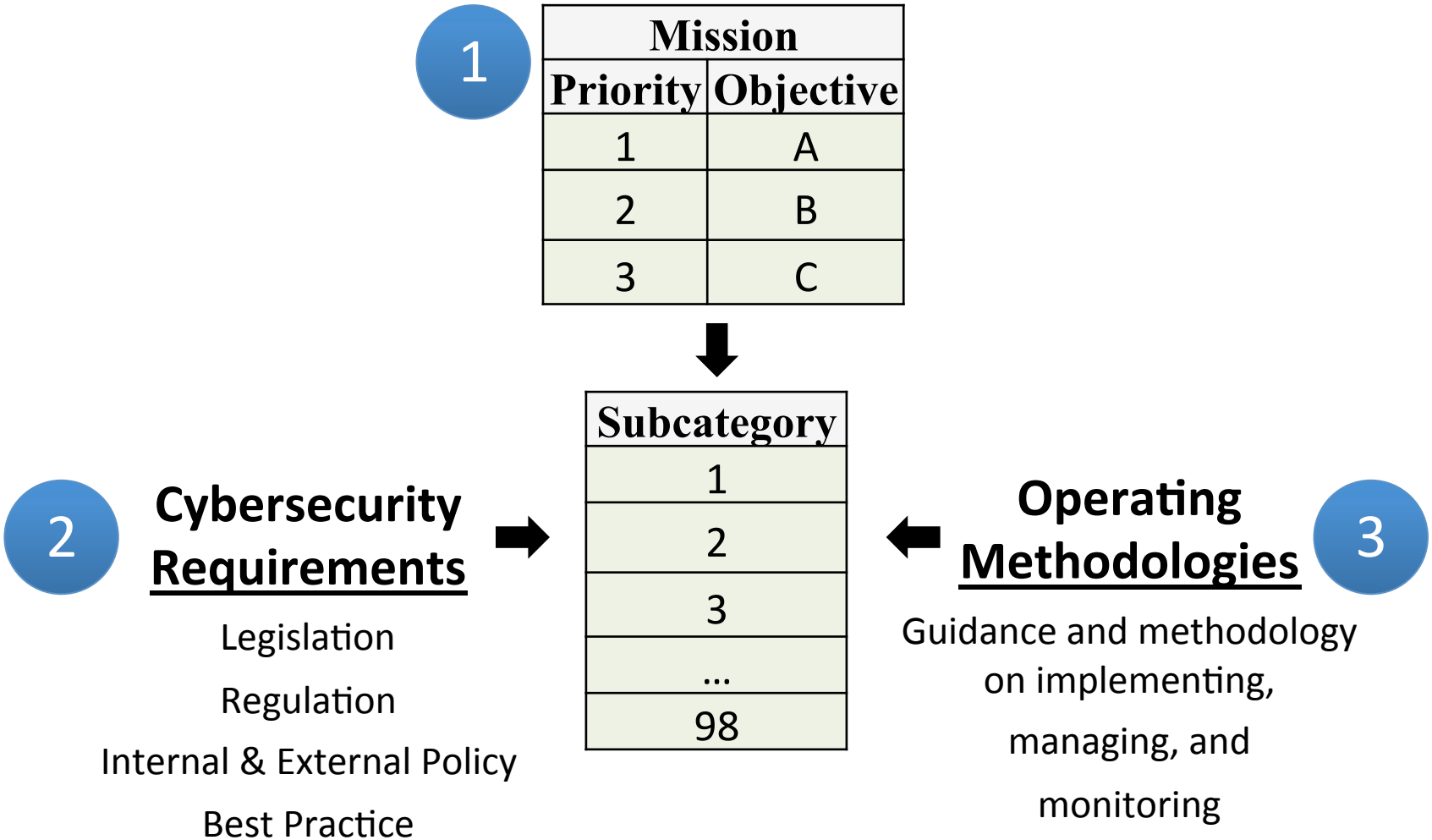
- A customization of the Core for a given sector, subsector, or organization
- A fusion of business/mission logic and cybersecurity outcomes
- An alignment of cybersecurity requirements with operational methodologies
- A basis for assessment and expressing target state
- A decision support tool for cybersecurity risk management

Using Profiles to Communicate Priorities



Building a Profile

A Profile Can be Created in Three Steps



Resource and Budget Decisioning

What Can You Do with a CSF Profile

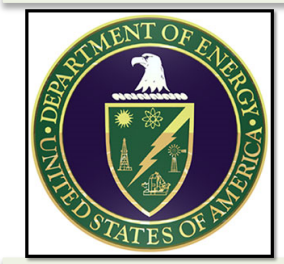
Sub-category	Priority	Gaps	Year 1 Activities	Year 2 Activities
1	moderate	small		X
2	high	large	X	
3	moderate	medium	X	
…	…	…		
98	moderate	none		reassess

…and supports on-going operational decisions too

Examples of Industry Resources

The Cybersecurity Framework in Action: An Intel Use Case

Cybersecurity Guidance for Small Firms



Energy Sector Cybersecurity Framework Implementation Guidance

Cybersecurity Risk Management and Best Practices Working Group 4: Final Report

Examples of State & Local Use

Texas, Department of Information Resources

- Aligned Agency Security Plans with Framework
- Aligned Product and Service Vendor Requirements with Framework

North Dakota, Information Technology Department

- Allocated Roles & Responsibilities using Framework
- Adopted the Framework into their Security Operation Strategy

Houston, Greater Houston Partnership

- Integrated Framework into their Cybersecurity Guide
- Offer On-Line Framework Self-Assessment

National Association of State CIOs

- 2 out of 3 CIOs from the 2015 NASCIO Awards cited Framework as a part of their award-winning strategy

New Jersey

- Developed a cybersecurity framework that aligns controls and procedures with Framework

Framework Roadmap Items

Authentication

Automated Indicator Sharing

Conformity Assessment

Cybersecurity Workforce

Data Analytics

Federal Agency Cybersecurity Alignment

International Aspects, Impacts, and Alignment

Supply Chain Risk Management

Technical Privacy Standards

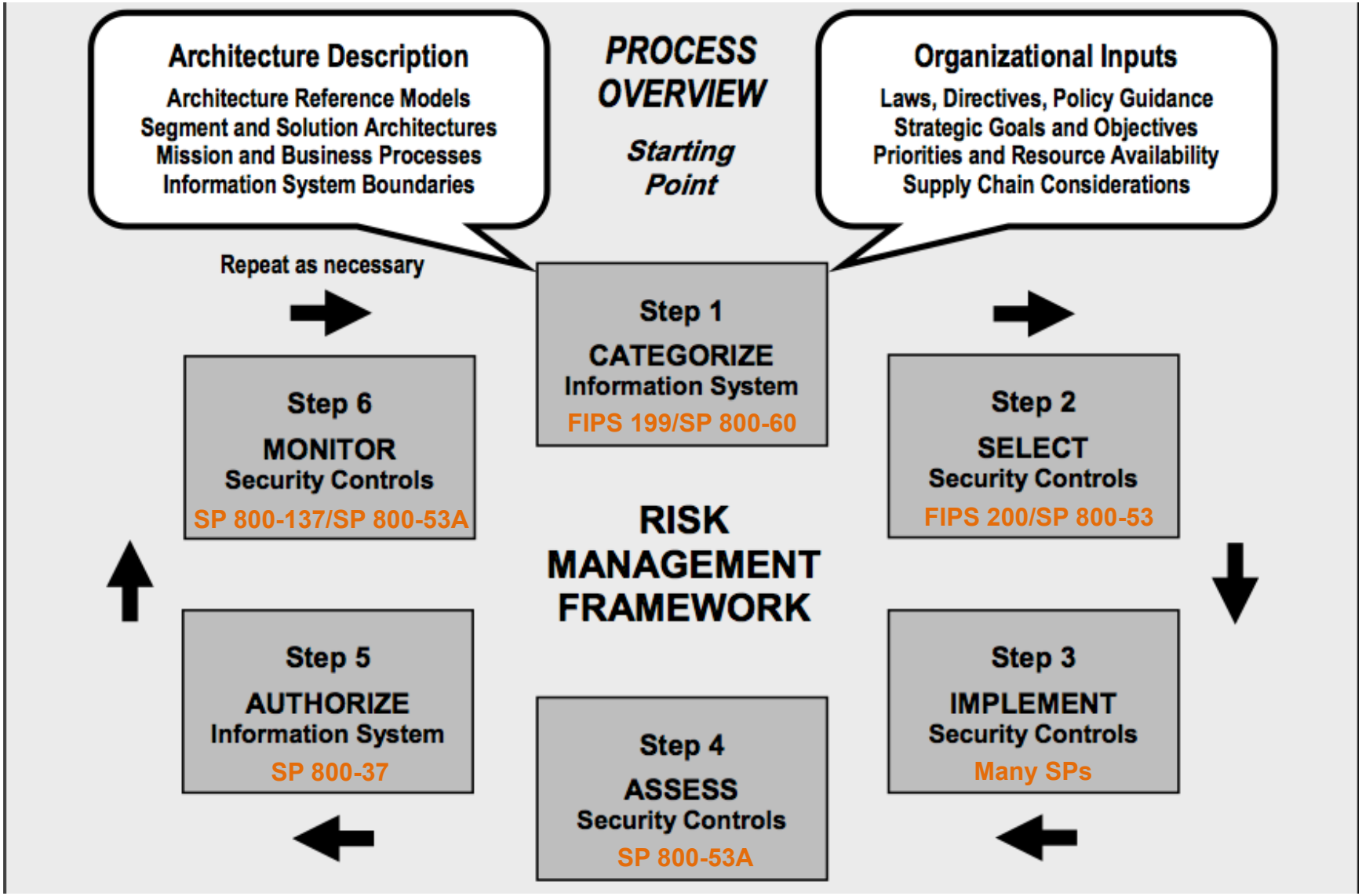
Ways CSF Can Support RMF

Draft Use Cases

- **Use case 1: Supporting SP 800-39 Frame activities with CSF Categories**
- **Use case 2: Supporting the RMF Categorize step with CSF Business Environment Materials**
- **Use case 3: Supporting the RMF Select step with a CSF Profile**
- **Use case 4: Supporting RMF Assess and SP 800-30 Assess with a CSF Profile**
- **Use case 5: Assessing the State of FISMA-Based Risk Management Practices**

Supporting the RMF Categorize Step

Use Case #2 for FISMA-Cybersecurity Framework Combined Use

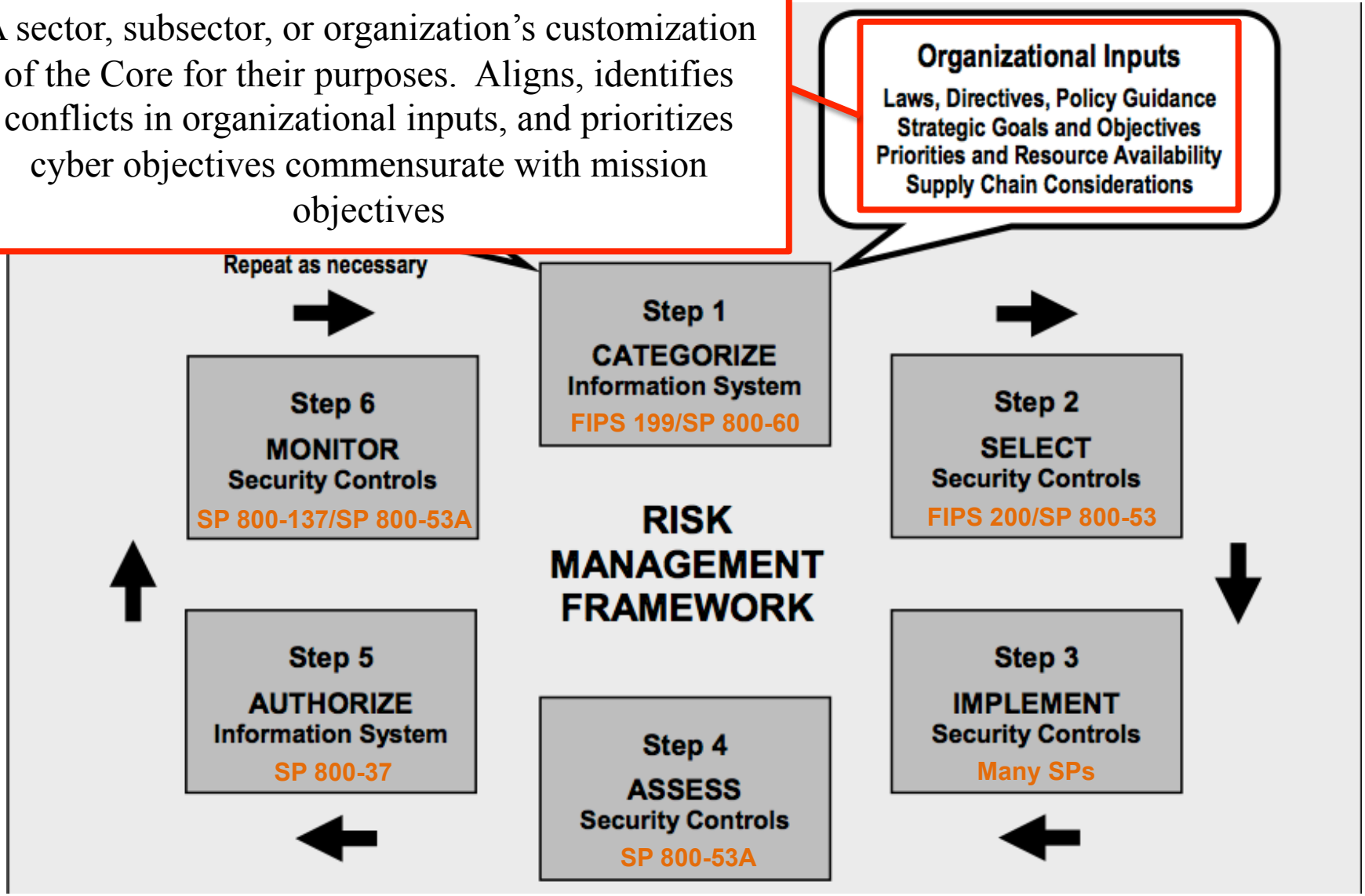


Supporting the RMF Categorize Step

ned Use

Profile

A sector, subsector, or organization's customization of the Core for their purposes. Aligns, identifies conflicts in organizational inputs, and prioritizes cyber objectives commensurate with mission objectives



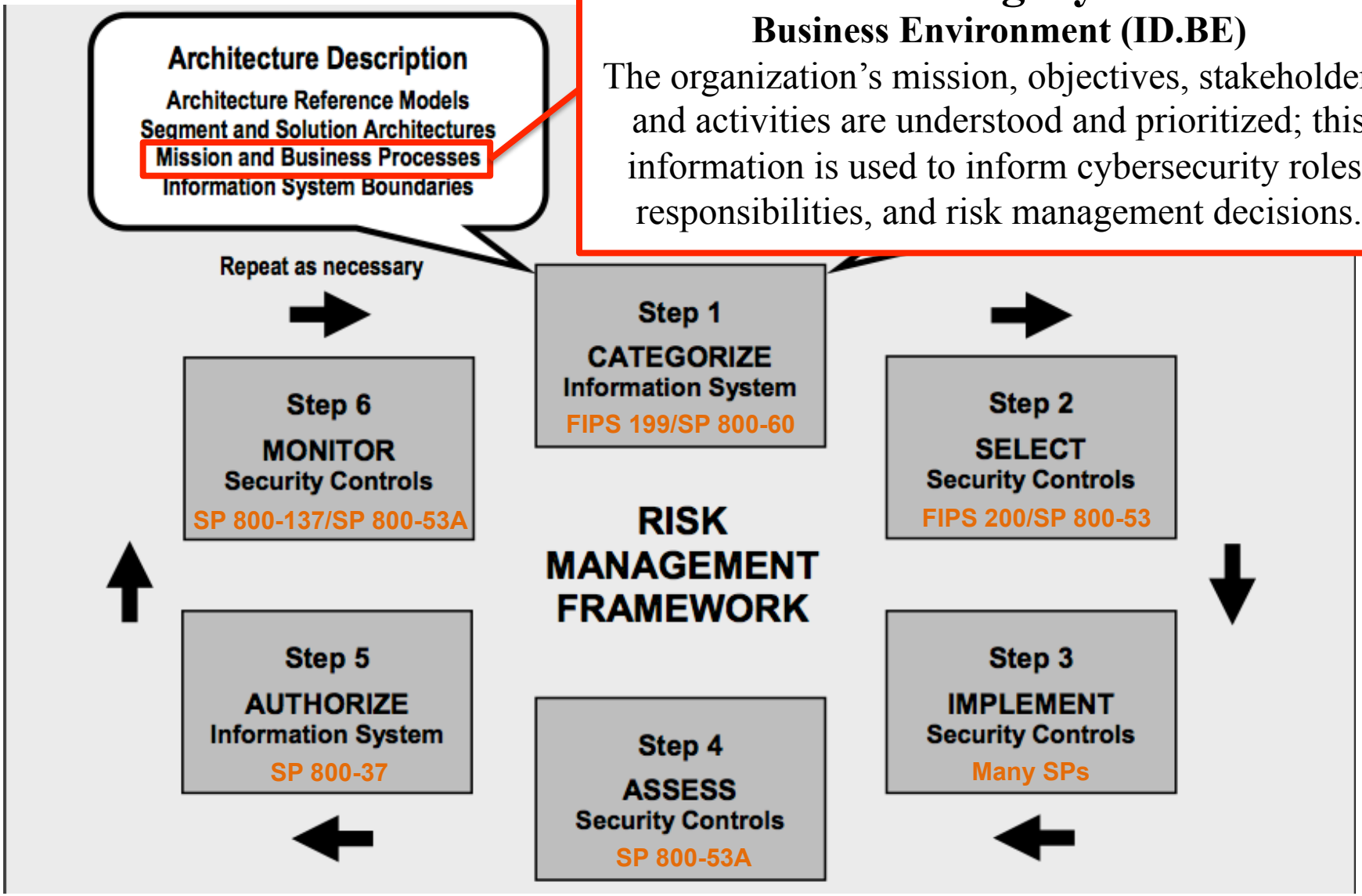
Supporting the RMF Categorize Step

Use Case #2 for FISMA-Cybersecurity F

Category

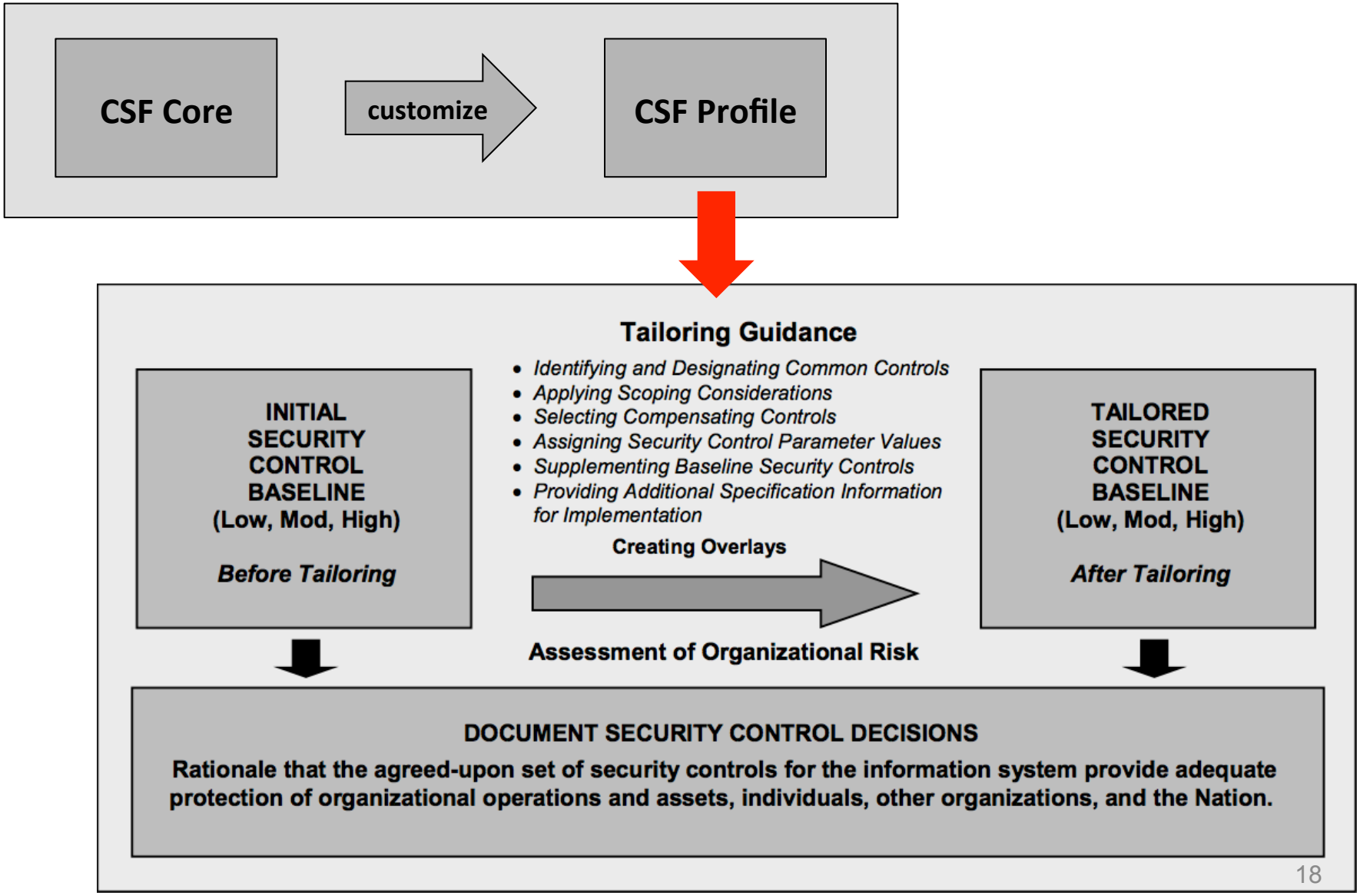
Business Environment (ID.BE)

The organization's mission, objectives, stakeholders, and activities are understood and prioritized; this information is used to inform cybersecurity roles, responsibilities, and risk management decisions.



Tailoring SP 800-53 Security Controls

Use Case #3 for Risk Management Framework & Cybersecurity Framework



Industry Dialog

Will it soon be time for a Framework update?

What governance models do you believe will work for future Framework maintenance and evolution?

If you have an opinion on these questions (and more), consider responding to our Request for Information - https://www.federalregister.gov/articles/2015/12/11/2015-31217/views-on-the-framework-for-improving-critical-infrastructure-cybersecurity

Responses due by 9 February at 5PM ET

Resources

Where to Learn More and Stay Current

The National Institute of Standards and Technology Web site is available at http://www.nist.gov

NIST Computer Security Division Computer Security Resource Center is available at http://csrc.nist.gov/

The *Framework for Improving Critical Infrastructure Cybersecurity* and related news and information are available at www.nist.gov/cyberframework

For additional Framework info and help
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