FCAPS Management for the Smart Grid
High-level Summary

(Fault, Configuration, Accounting, Performance & Security Management)

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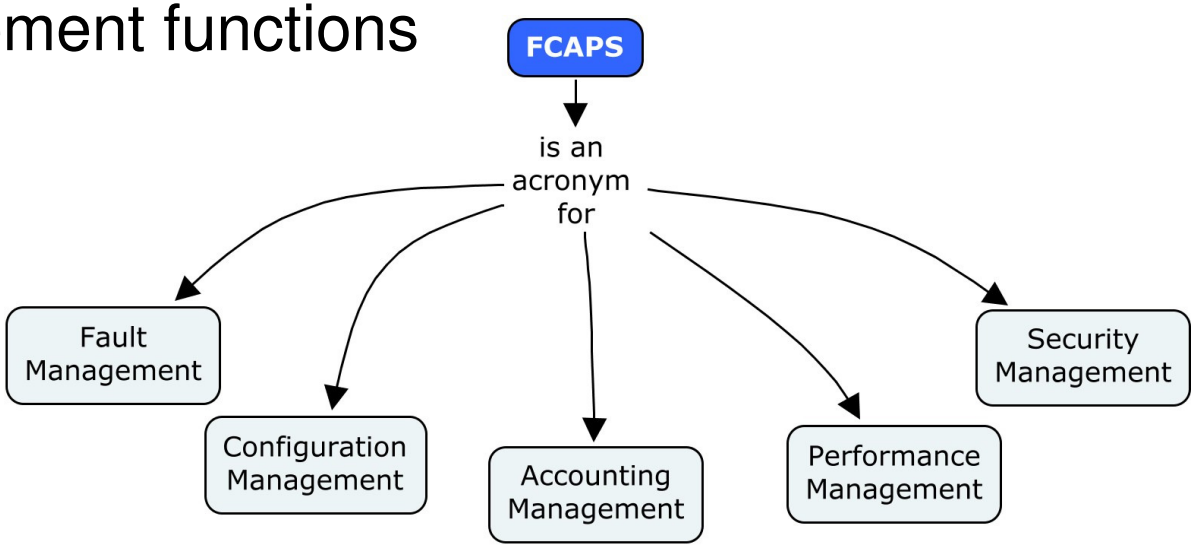
May 6, 2009

Introduction

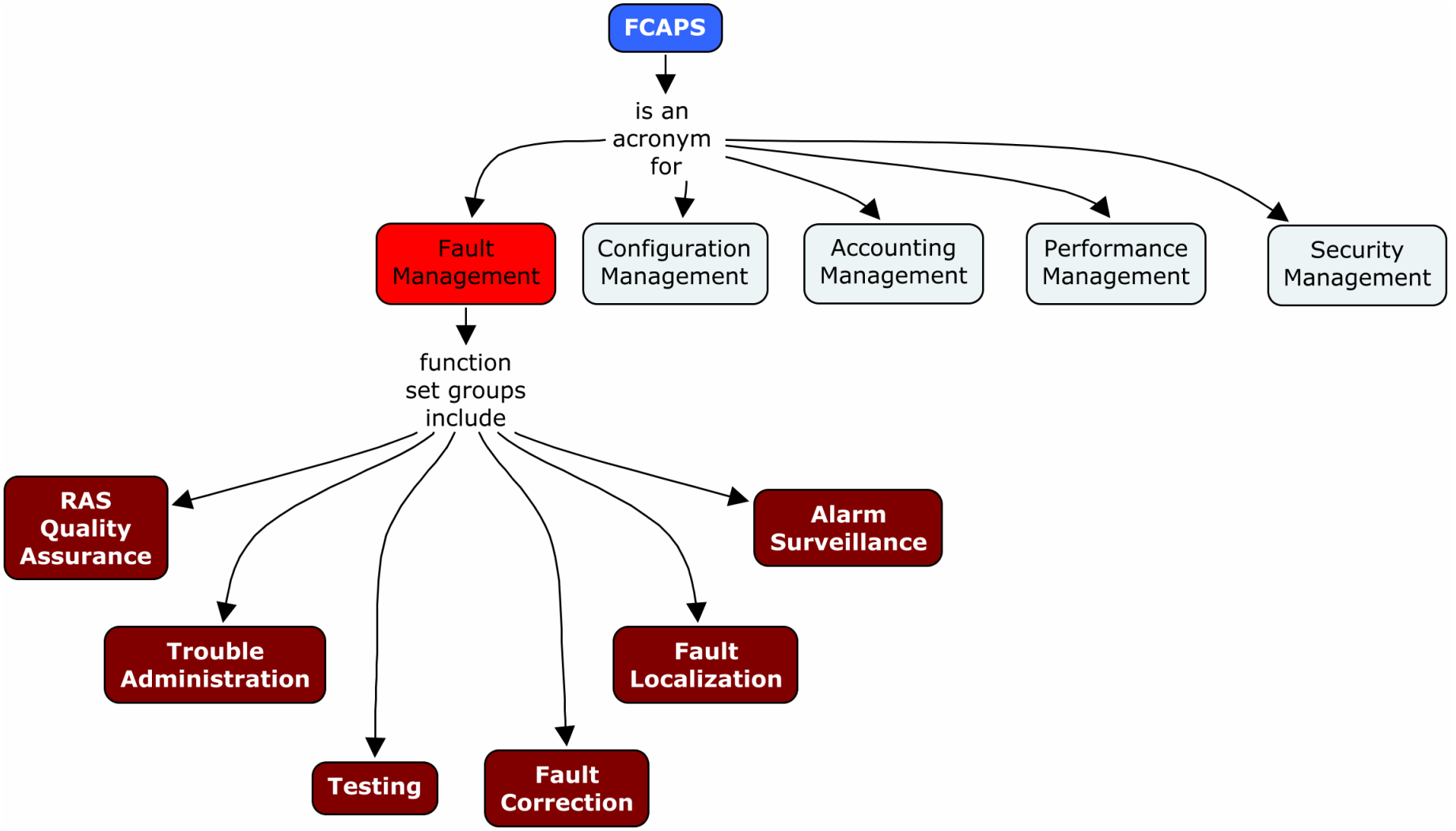
- FCAPS is a process methodology that initially was developed by the ISO and ITU standards development organizations
- Used for systems management of various technologies
- Described within the following international standard:
  - ITU-T Recommendation M.3400, 02/2000, TMN management functions



What is FCAPS?

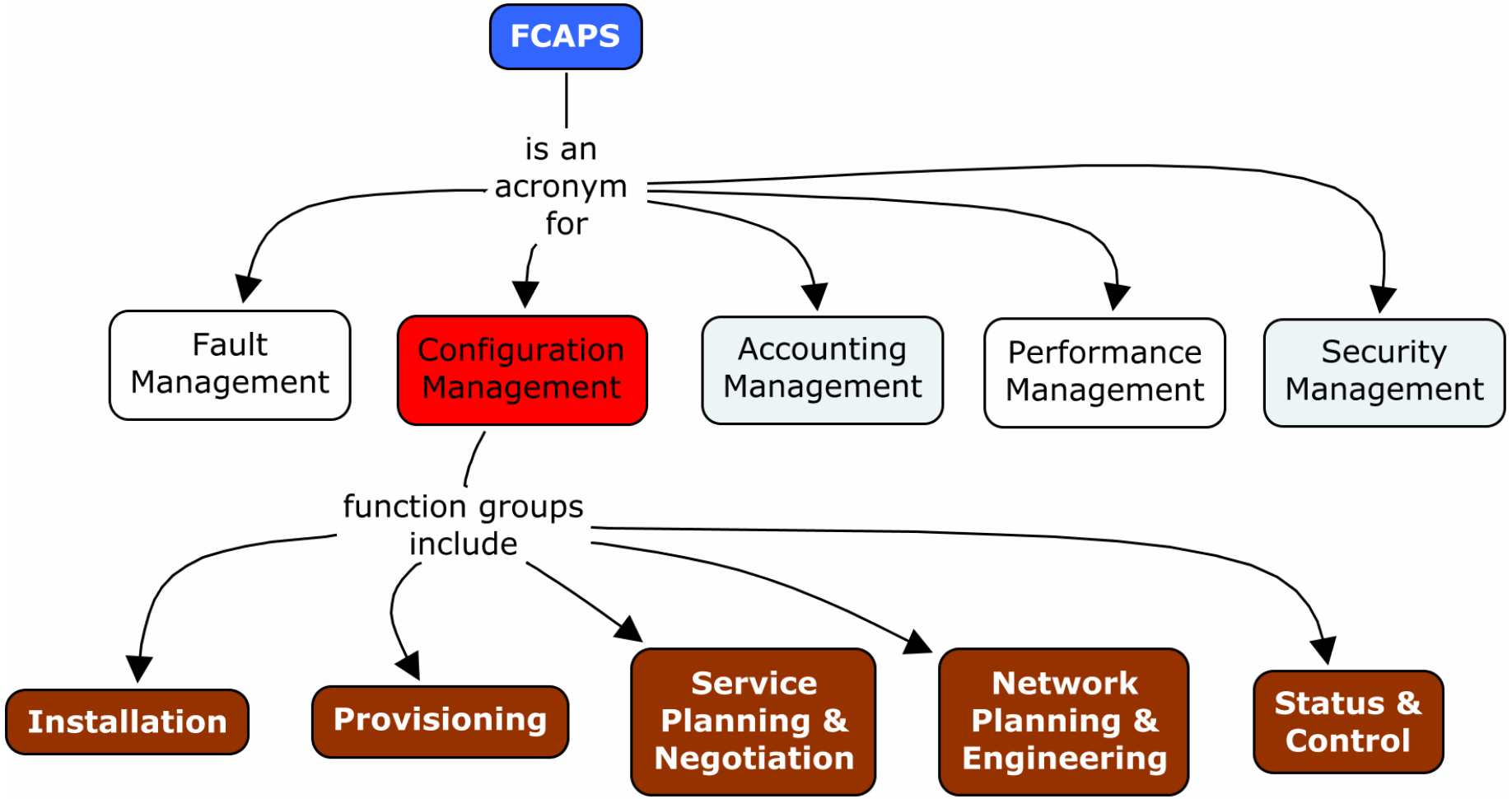
- Fault Management – set of functions which enables the detection, isolation & correction of abnormal operation of the telecommunication network & its environment
- Configuration Management – provides functions to exercise control over, identify, collect data from & provide data to Network Element(s)
- Accounting Management – enables the measurement of the use of network services & the determination of costs to the service provider & charges to the customer for such use
- Performance Management – provides functions to evaluate & report upon the behavior of telecommunication equipment & the effectiveness of the network or network element
- Security Management – provides for the management of security & includes security services for communications & event detection and reporting

Fault Management – Function Sets

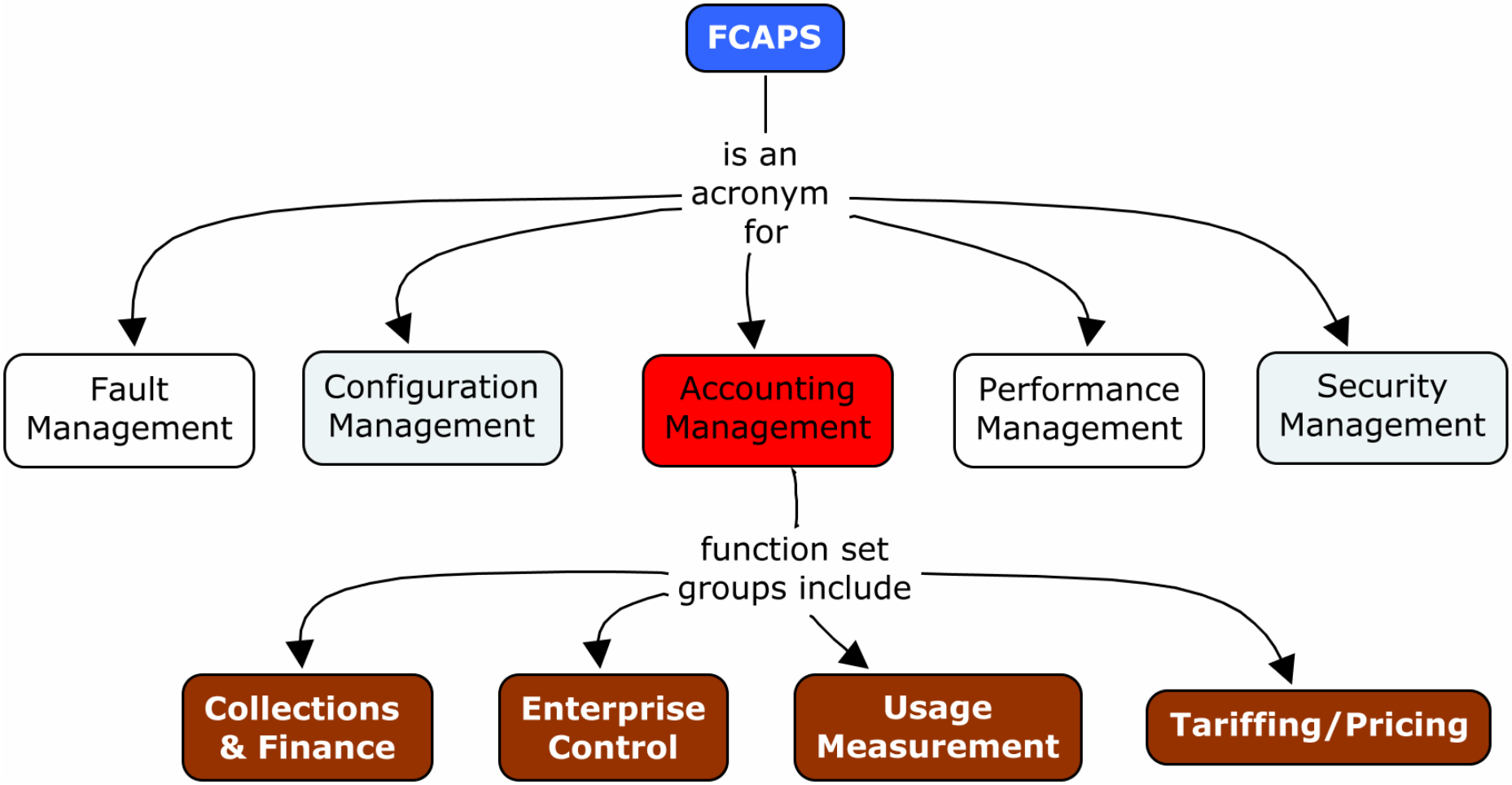


- RAS = Reliability, Availability, Survivability

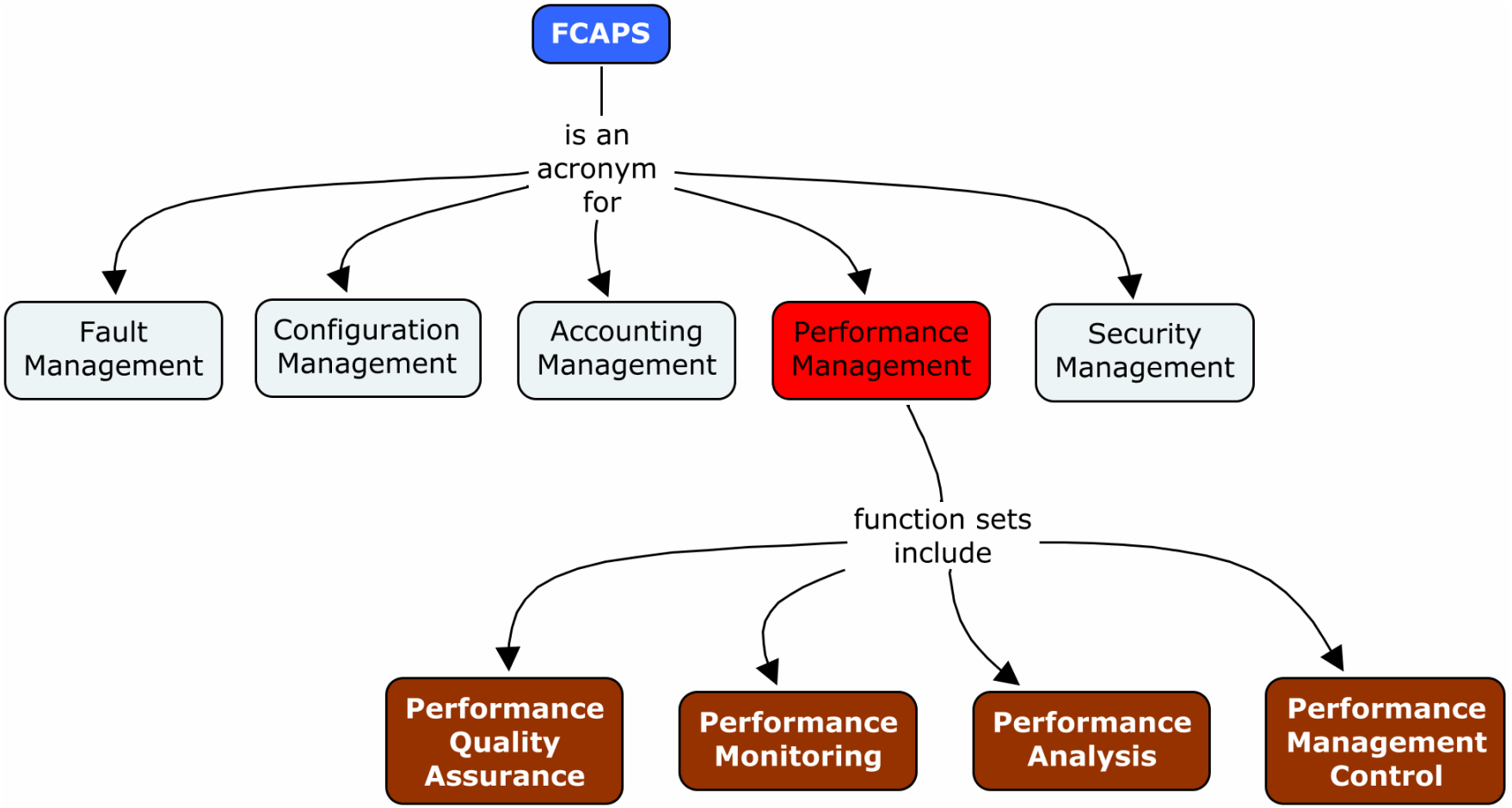
Configuration Management – Function Groups



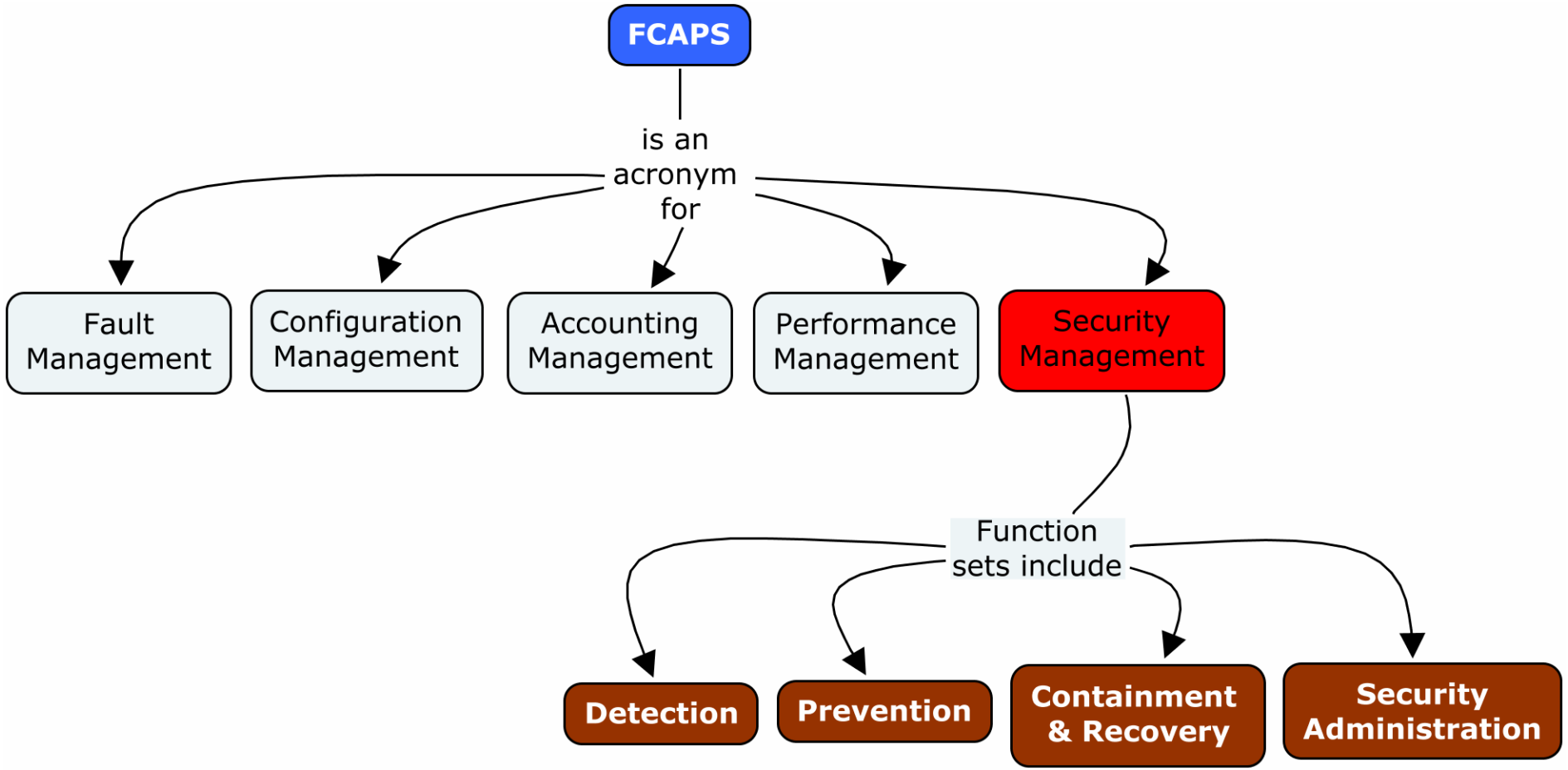
Accounting Management – Function Groups



Performance Management – Function Groups



Security Management – Function Groups



FCAPS Management – What Example

- The FCAPS process manages the following and others:
  - Networks (public & private), including narrow and broadband, mobile networks, private voice networks, VPN & intelligent networks, Circuit & packet switched networks, Area networks (WAN, MAN, LAN, etc.)
  - Transmission terminals (multiplexers, cross-connects, channel translation equipment, etc.)
  - Digital & analog transmission systems (cable, fiber, radio, satellite, etc.)
  - Operating Systems & peripherals
  - Mainframes, front-end processors, cluster controllers, file servers, etc.
  - Digital & analog exchanges, bearer services & teleservices, PBXs, PBX accesses & user (customer) terminals
  - Signaling terminals & systems including signal transfer points & real-time databases
  - Software provided by or associated with telecommunications services (e.g., switching software, directories, message databases, etc.)
  - Associated support systems (test modules, power systems, air conditioning units, building alarm systems, etc.), restoration systems
  - Distributed entities & services offered by grouping items in the above list
  - Managed resources related to the processes used in the operation of equipment, networks & services
    - Examples of such managed resources are equipment repair service order, trouble tickets generated by customer complaints, customer contract for service provisioning, service level agreements, historical data, etc.