

CS 510: Network Management

Lecture 05

Dr. Aliq Ahmed - Université de Babouchatan

Plan

- Policy-Based Network Management

Dr. Aliq Ahmed - Université de Babouchatan

2

Policy-Based Network Management

- Combination of rules and services where rules define the criteria for resource access and usage
- An aggregation of policy rules that contain
 - A set of conditions
 - Corresponding set of actions
- PBM is a management paradigm that separates the rules governing the behavior of a system from its functionality

Dr. Aliq Ahmed - Université de Babouchatan

3

Policy-Based Network Management

- Reduces maintenance costs of information and communication systems
- Improves flexibility and runtime adaptability
- Free the manager from monitoring the equipments and systems directly and supply a systematic method for establishing, revising, and distributing policies

Dr. Aliq Ahmed - Université de Babouchatan

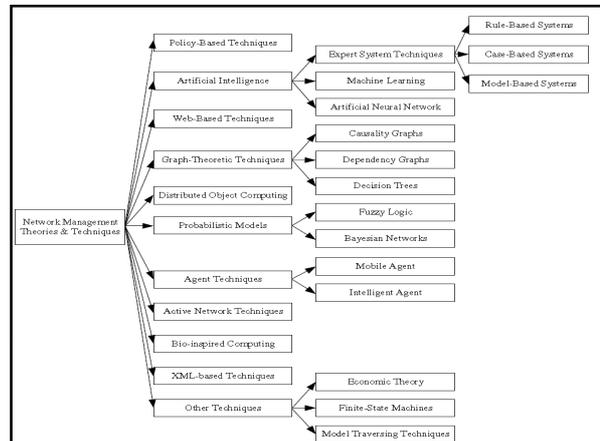
4

Some Merits of PBM

- When system requirement alters, it is only necessary to change or add some new policies instead of re-coding
- The best use of the resources by flexible distribution of the resources according to the dynamic information and the different requirements of various service types
- Different users use different policies which makes the system more extensible and maintainable
- Make the system less dependent on the system manager and make the system more intelligent

Dr. Aliy Ahmed - Université de Babouchistan

5



PBM Architecture

- **Policy Management Tool** is the server or host where policy management software can do
 - policy editing
 - policy presentation
 - rule translation
 - rule validation
 - global conflict resolution

Dr. Aliy Ahmed - Université de Babouchistan

7

PBM Architecture

- **Policy Information Repository** is a data store for policy information which may be application specific, operating system specific, or an enterprise common repository
- Policy information repository can
 - store policy information
 - search policy information
 - retrieve policy information

Dr. Aliy Ahmed - Université de Babouchistan

8

PBM Architecture

- **Policy Decision Point (PDP)** is the arbitration component for policy evaluation, which evaluates a state or condition to determine whether a policy enforcement action is required
- PDP can work as
 - rule locator
 - device adapter
 - state resource validation (requirements checking)
 - policy rule translation
 - policy transformation

Dr. Aliq Ahmed - Université de Babouchatan

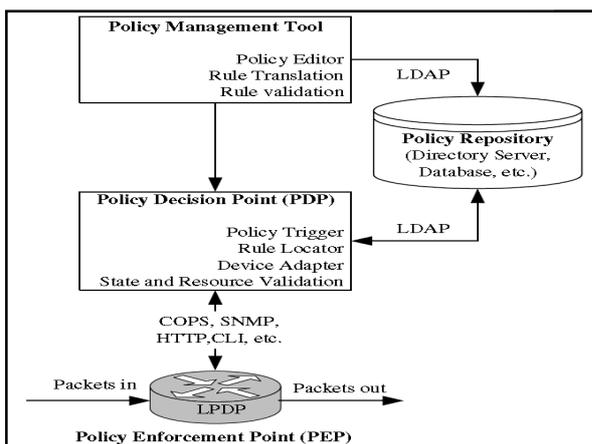
9

PBM Architecture

- **Policy Enforcement Point (PEP)** is a network device, such as a router, switch, firewall or host that enforce the policies received from the PDP
- Policies are enforced (through dynamic configuration changes to access control lists, priority queues or other parameters) as directed by the policy decision point
- PEP can do
 - Specified Operation by policy rule
 - Optional policy rule validation
 - Feedback

Dr. Aliq Ahmed - Université de Babouchatan

10



Characteristics of a PBNM

- **Extensibility**
 - Customization & Expansion
 - Management & provisioning of other services
 - Support extensions through interfaces
- **Functionality**
 - Ensure and control bandwidth
 - Configure usage and QoS (authentication and/or encryption)
 - Define QoS treatment of encrypted flows (combine security and QoS Policies)

Dr. Aliq Ahmed - Université de Babouchatan

12

Characteristics of a PBNM

- **Heterogeneity**
 - Manage QoS in multi-domain networks
 - Enable end-to-end QoS management
 - Configure security services with gateways from different domains on each side
- **Scalability**
 - Support hierarchical policy management
 - Enable policy management across multiple policy domains
 - Support key standards (IETF, ISO, DiffServ, IPSec,...)

13

Dr. Aliq Ahmed - University of Babcock

Characteristics of a PBNM

- **Usability**
 - Integrate with existing management solutions
 - Hide the detail and present useful concepts and interfaces

14

Dr. Aliq Ahmed - University of Babcock