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Quality of Security Service (QoSS) Demo

Spyropoulou, Evie; Allen, Bruce; Agar, Chris; Smith, Kevin; Wu, Peter; Mohan, Raj

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1: Overview
The Quality of Security Service (QoSS) demo exhibits a structure for controlling the quality of security services in an environment where network load and security demands may vary.

2: QoSS GUI
The main window contains the following:

- Status information indicating the selected task, mode and security level.
- A *Current Security Selections* table which identifies the security policies in effect for the task and indicates the range and current selection of parameter values.
- A *Security Service Costs* table which identifies the six costs for each of the security services provided.
- Menu bar.

2.1: Menu Bar
The menu bar contains the following menu items:

2.1.1: User
The *user* menu provides the following submenus for the system user:

- *Load Task* allows the user to select a predefined task.
- *Security Level* allows the user to select the desired security level in which to operate.

2.1.2: Administrator
The *administrator* menu provides the following submenus for the system administrator:

- *Mode* allows the administrator to select the mode of the system.
- *Define Task* opens a window which allows the administrator to create new tasks or delete existing tasks. New tasks are created as a snapshot of the system configuration which includes selected policies, ranges, the selected network mode, the security level, and the resource manager strategy.
- *Security Services* opens a window allowing the administrator to select the security services required by the task and to view the six costing formulas applicable to each service. A future release will allow the administrator to click on a formula and select an alternate formula from a pull-down list.
- *Security Policies* opens a window allowing the administrator to define allowable ranges for security policy values. Ranges are defined for all security levels of all modes.

2.1.3: Resource Manager
The *Resource Manager* menu provides an interface for simulating control from actual Resource Manager input. This menu provides one submenu, *Resource Manager Strategy*. The selected strategy is used to pick discrete security policy values from available ranges.

2.1.4: Help
Opens a window displaying information about QoSS.

3: Extensibility
QoSS requires extensibility. The system must be readily configurable to support new tasks as they are identified. New security services must be defined in the system as new services are identified and required. Security service costing formulas must change when the method of providing the service changes. New security policies must be introduced as new security provisions are offered.
This section discusses the extensibility of tasks, security services and security policies, and identifies the requirements imposed on the System Administrator and the Software Engineer for providing this extensibility.

3.1: Tasks
The System Administrator defines and saves tasks. The administrator selects the applicable security services from a complete list of security services defined in the system. The administrator selects the appropriate cost formulas for the tasks and specifies the allowable ranges for the security policies. The Administrator selects the default mode, level and strategy for the task, and then saves the task by name.

3.2: Security Services
Every possible security service is identified and modeled. The characteristics of any given service is encapsulated in a *Security Service Interface*. This interface provides a means for the following:

- Providing the name of the security service.
- Providing the six cost values imposed by the service. (Security policy values are referenced to calculate these cost values.)
- The ability to enable or disable the service as appropriate for the task involved.
- The means to select specific cost formulas from a collection of available cost formulas (future development).

New security services may be created and inserted into the QoSS demo as needed without changing the structure of the demo by implementing the required security service interface.
Any security service may make reference to any security policy so long as the referenced policy exists. Security services must have knowledge of the object names of the security policies that they wish to reference.

3.3: Security Policies
Each security policy is identified and modeled. The characteristics of any given policy is encapsulated in a *Security Policy Interface*. This interface provides the following:

- The name of the security policy.
- The strings identifying the possible policy values.
- The means to define the nine possible policy ranges (three unconstrained ranges for the modes and three constrained ranges each for the levels.
- The means to export a discrete policy value based on a given mode, level and strategy.

New security policies may be created as needed by implementing the Security Policy Interface. Security policy objects should be given meaningful names because these objects are referenced by security service objects.

4: Implementation

4.1: Attributes

- Internally know but not export the sorted String[] of all valid attribute values.

- Manage each String setting individually via set/get min/max cap/mode/security.
- Export a valid String[] range appropriate to a specified (mode, level) value. A Resource Manager <u>must</u> be able to find a usable value from this range set.
- Manage a cached String value via set/get. This is the task's cache of the established current value of the attribute.
- Export the attribute name, the number of valid attribute values, and a displayable subset of attribute values for GUI display purposes.

4.2: Services

- Allow the service to be enabled (applicable) or disabled (not applicable to the task).
- Allows cost formulas to be imported. Formulas must be imported before costs can be calculated.
- Export the calculated value of a given cost.
- Export the service name and the String representation of any given formula for GUI display purposes.

4.3: Formulas

- Recognize and indicate whether a set of attributes are supported without instantiating the formula.
- Instantiate links to referenced task attributes for all formula parameters.
- Export the calculated cost value. Cost values are calculated by knowing the costs related to the String values obtained from the linked attribute's cache.

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