Lightweight Security Service for CORBA

orbLOCK™

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Why Build A Lightweight Security Service?

- Why developing implementation of the Resource Access Decision Facility is driving development of a lightweight security service.
- Overview, objectives, features, ...

Resource Access Decision Facility

- Specification developed by the OMG to address the problem of business logic access control.
    - Standard format for naming protected resources.
    - Removes security policy from business logic.
    - Standard administrative interfaces for assigning policy to a resource.
    - Supports multiple policy engines and does not dictate policy mechanisms.
    - Security policies support multiple operations (e.g "read", "write", "obliterate", …)
    - Dynamic attribute service can modify security attributes that are used to make decisions.

- Fully compliant implementation of RAD with Patterns.
- Default Policy Evaluator supports:
  - Multiple rules per operation.
  - Each rule can be “AND ACL”, “OR ACL”, “DENY ACL”, “Anybody”, or “Nobody”.
  - Supports time constraints by date, time, day of week.
- Collocation, Policy caching/notification, ...
- CORBA interfaces and CORBA convenience classes
- Java iLock Interface (JII) supports local policy evaluators and dynamic attribute service. CORBA transparent.
- Multiple platforms, multiple ORB’s, location services, ...

How do I get the attributes?

- Heart of the RAD specification is the AccessDecision interface.
    - Main operation is:

```
boolean access_allowed ( ResourceName name,
                         string operation,
                         SecAttributeList attributes);
```

    - The SecAttributeList comes from:

SecurityLevel1.Current.get_attributes();

- ***Problem: Where does SecurityLevel1.Current come from?***
- ***Solution: Build our own.***

Lightweight Security Service

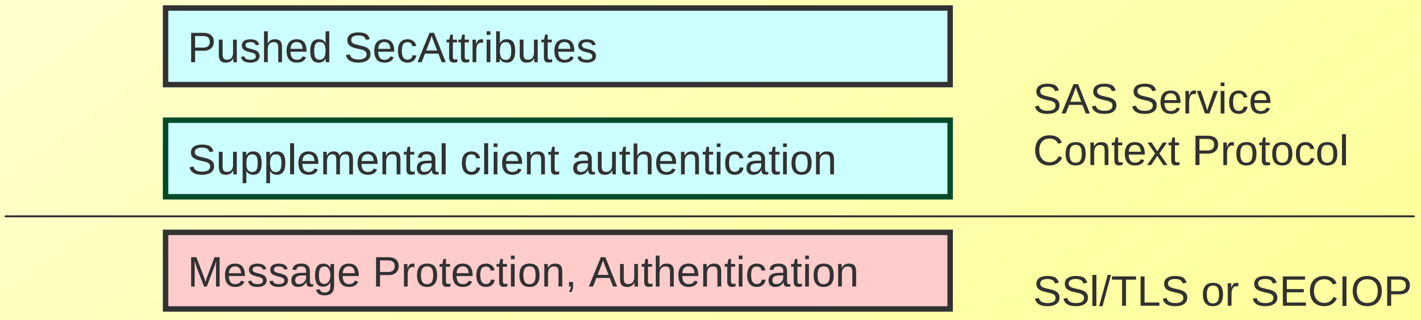
- Goals
  - Meet requirements of 80%, expend 20% effort.
  - 100% transparent for application code.
  - 100% portable. Do what we can with Portable Interceptors, leave work requiring message interception alone.
  - Flexible support for different security mechanisms.
  - Support for authentication, delegation, access decision, and auditing.
  - Use iLock for access decision engine.
  - Simple administration

Lightweight Security Service - cont.

- Goals - cont
  - Supplement existing transport layer security services.
  - Provide minimal application control.
    - Object security domains
    - Unsecured objects
    - Control delegation
- Non - goals
  - Provide transport layer protocols (e.g. SSL)
  - Support message cryptography
  - Support for C++ ORB’s (this could change)
  - Compliance with any specifications

Common Secure Interoperability V2

- Features
  - Exchange protocol elements via service contexts
  - Layers above transport layer security (SSL/TLS or SECIOP)
  - Authentication layer for client authentication
  - Attribute layer to push security attributes


Pushed SecAttributes
Supplemental client authentication
Message Protection, Authentication
SAS Service Context Protocol
SSl/TLS or SECIOP

Common Secure Interoperability V2

- Problems
  - Conformance (0, 1, and 2) requires support for SSL/TLS connections.
    - Violates our goal to not implement transport layer security.
  - Only one **TAG_CSI_SEC_MECH_LIST** tagged component.
    - Violates our goal to interoperate with existing transport layer protocols.
  - Namespace conflicts - **org.omg.SecurityLevel.Current**
    - Violates our goal to interoperate with existing solutions

Lightweight Security Service

- Features
  - Supports authentication with X.509 digital certificates.
  - Replaceable authentication to support other mechanisms including proprietary and standard transport layer security services.
  - Attribute management with LDAP.
  - Replaceable attribute management.
  - Applications can secure objects/operations with no code changes.
  - Supports delegation (SecNoDelegation, SecSimpleDelegation, …)
  - Support auditing.

Lightweight Security Service

- Features continued
  - Programming interfaces allow:
    - Get current security attributes
    - Set POA policy to turn off security.
    - Client control of delegated attributes.
  - Use iLock for AccessDecision engine.
  - Simple administration
    - IDL parser to create operation resources
    - Simple policies with “invoke” operation.
    - Create security domain resources.
    - Auditing, …

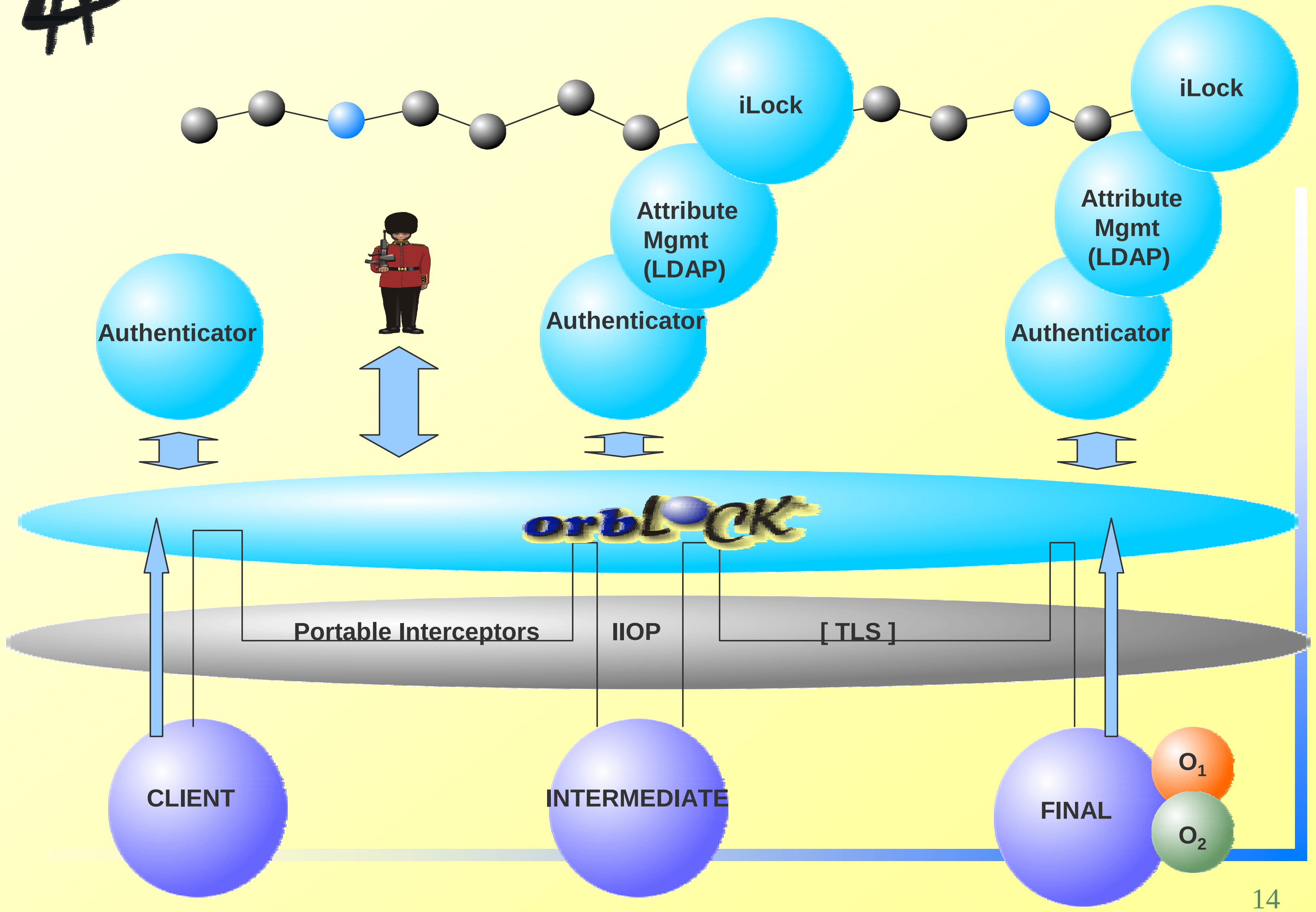
Lightweight Security Service

- Using iLock for AccessDecision
  - IDL Operations map to RAD Resource Name Mapping
    - IDL:omg.org/DfResourceAccessDecision/AccessDecision:1.0
      - Op = access_allowed
  - iLock Security Policies define “invoke” operation.

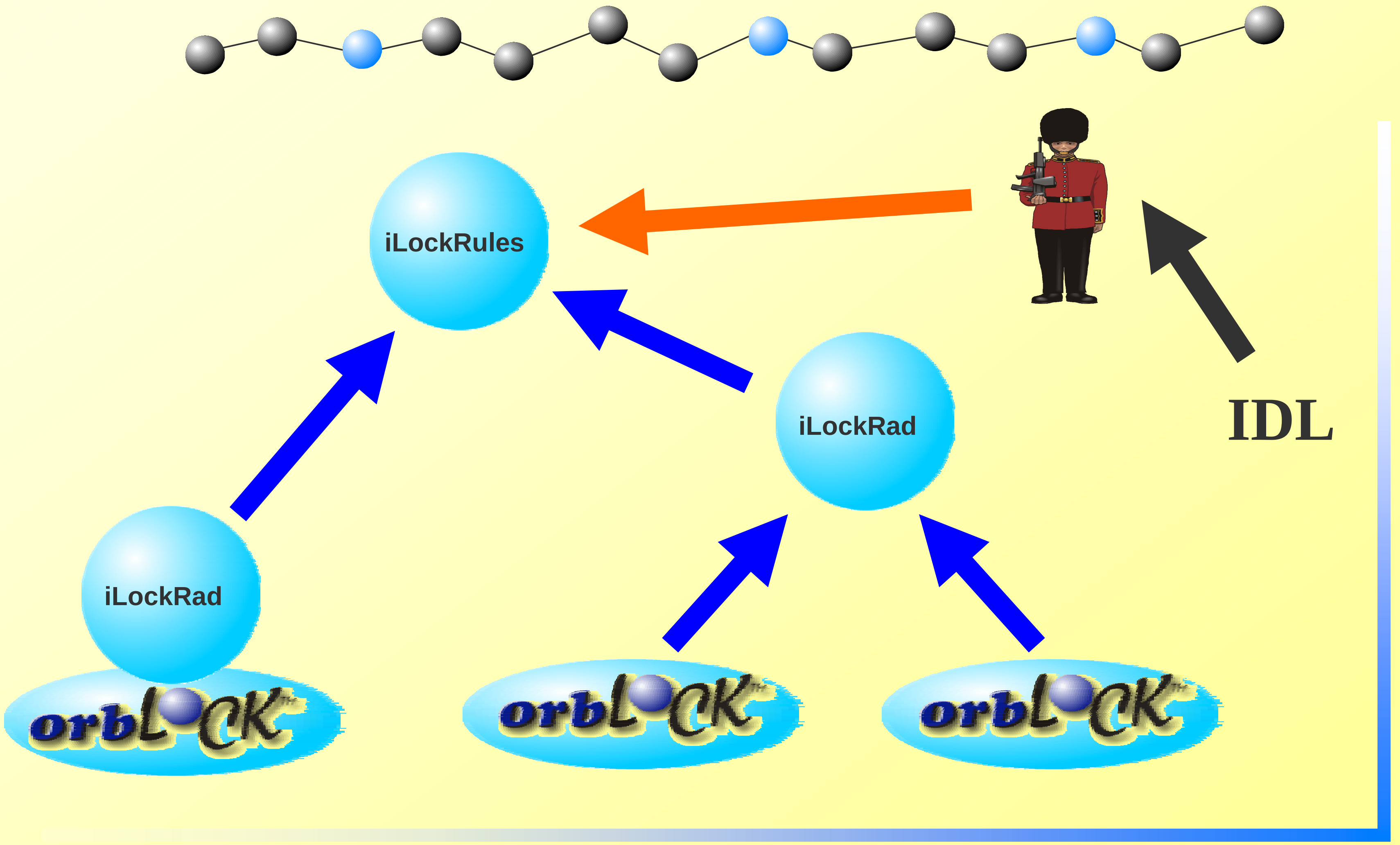
Lightweight Security Service

- Replaceable Components
  - Authenticator
    - byte [ ]   getToken()
    - SecAttribute [] authenticateToken(byte [ ] token)
      - throws AuthenticatorError
  - Attribute Manager
    - SecAttribute [] lookup(String name)
    - SecAttribute [] lookup(byte [ ] token)

Lightweight Security Service



Lightweight Security Service - Deployment



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