



COMPACFLT - EDAC

Enterprise Dynamic Access Control (EDAC)

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Approved for public release; distribution is unlimited.



COMPACFLT - EDAC

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Outline

- Access control background

 - Access control lists

 - Groups

 - NIST RBAC standard

- SEAC RBAC

 - Customer furnished and maintained assets

 - How it works

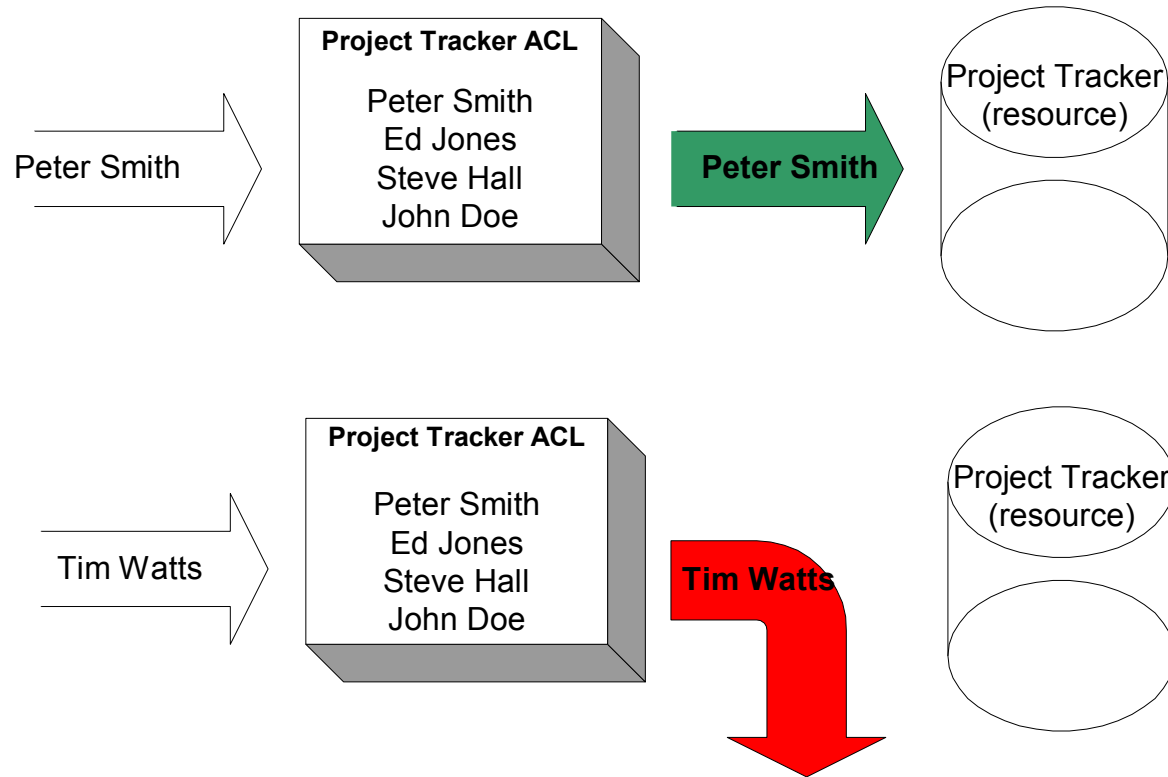
 - Product overview

 - Interoperability



Access Control Lists (ACL)

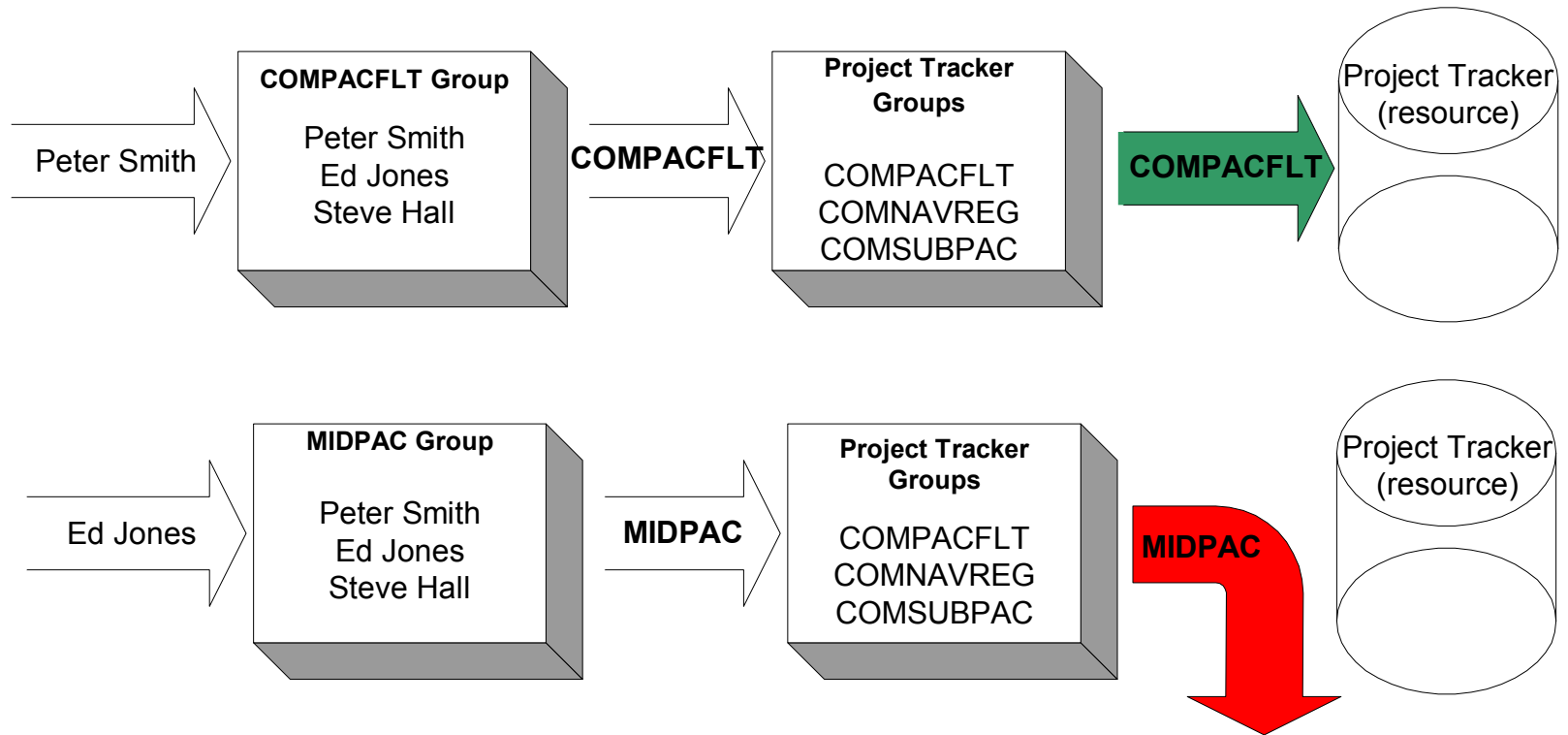
User name or unique identifier associates access to resources





Groups

User associated to a group and group associated to resources





Essentials for resource access

Necessary requirement to access resources:

- Not a user name
- Not a unique identifier
- Not a group association

- List of user characteristics



What are user characteristics

User characteristics (user profile)

- Where client works: **organization**
- What security credentials: **clearance**
- What pay category: **pay grade**
- What branch : **service**
- What vocation: **job function**
- etc



Examples of User Profiles

- User profile is a unique list of user characteristics.
- A client may have more than one user profile.
- User attributes should be compiled from an authoritative data source(s) on a real-time basis.

<u>Categories</u>	<u>COMPACFLT</u>	<u>USNR</u>
Organization:	CPF N65	Naval Intel
Clearance:	Secret	Top Secret
Paygrade:	DP3	02
Service:	DoD	DoNR
Function:	Program Manager	Intelligence



Impact on resource access

The following can affect resource access:

- Transfer to another organization
- Loss of security clearance
- Change in job title
- Job promotion

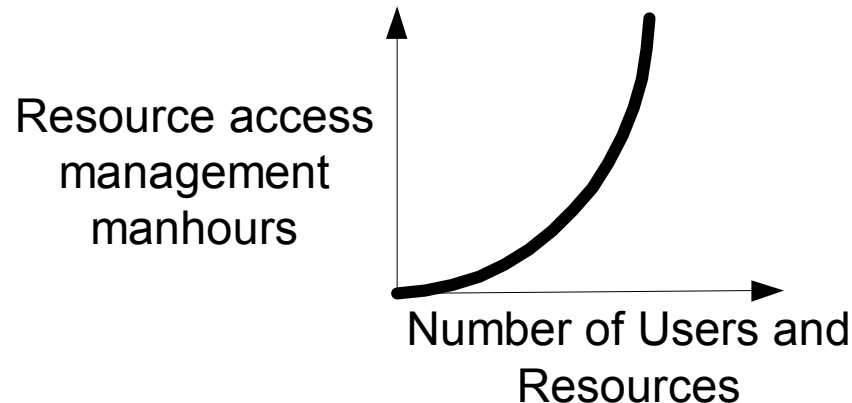


Problems with ACLs and Groups

Maintaining an updated ACL or group is time consuming.

Situation worsens when:

- Number of users increase
- Number of resources increase





NIST RBAC compliance

Because of ACL and group limitations:

The National Institute of Standards and Technology (NIST) RBAC is an American National Standard - ANSI INCITS 359-2004 (approved 19 Feb 04)



NIST RBAC standard

Definitions:

Users and Roles: *"...access decisions are based on the roles that individual users have as part of an organization.*

"Access rights are grouped by role name..."

Role hierarchies: *"Under RBAC, roles can have overlapping responsibilities and privileges;*

Roles and Operations: *"Organizations can establish the rules for the association of operations with roles.*



Access control comparison

How access control solutions can simultaneously evaluate user characteristics.

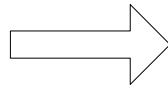
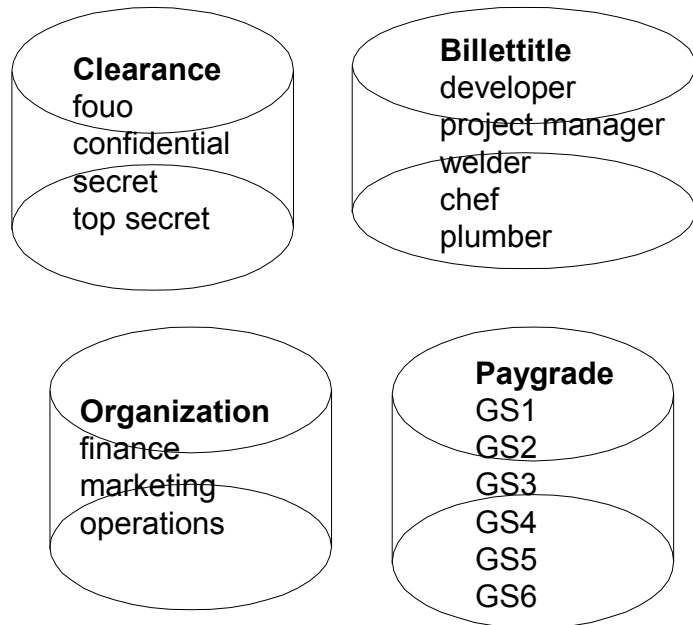
	Simultaneous evaluation of multiple object characteristics & environmentals	Simultaneous evaluation of multiple object characteristic & environmental hierarchies	Real-time detection of object characteristic changes, thus affecting resource access
ACLs	0	No	No
Groups	1	No	No
EDAC	Unlimited	Yes	Yes



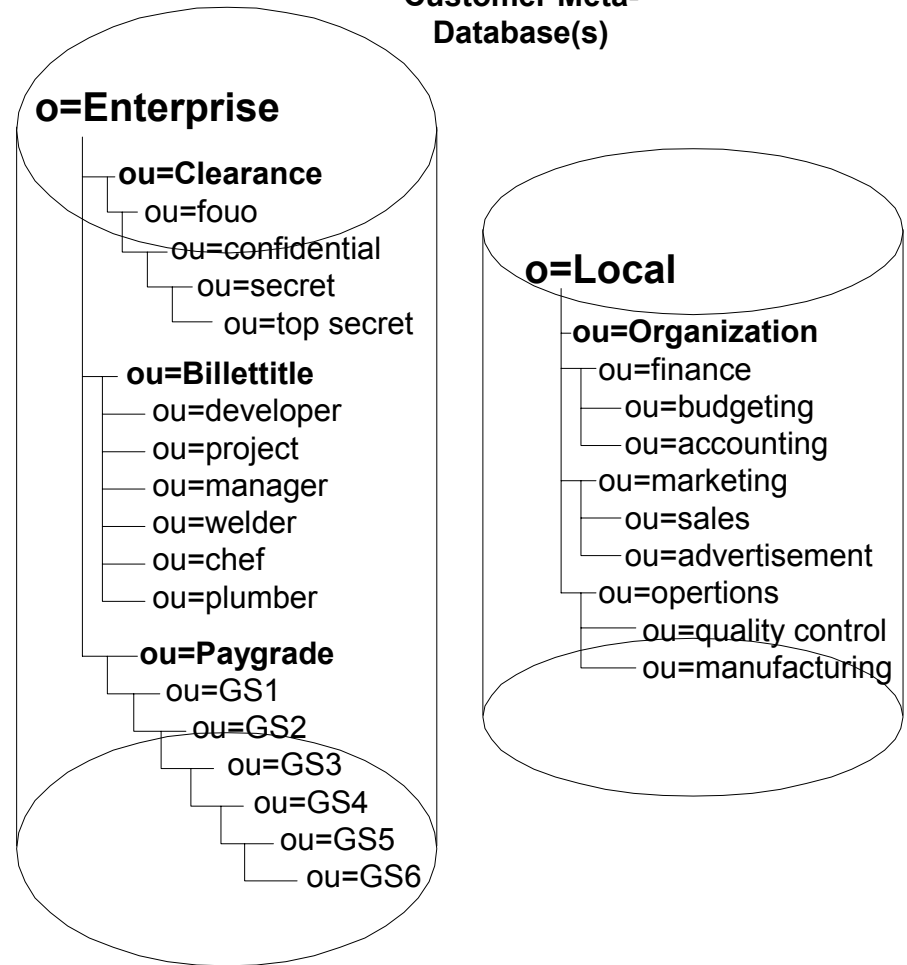
Customer meta-database background

Relational database data duplicated on a directory service.

Customer Personnel Database(s)

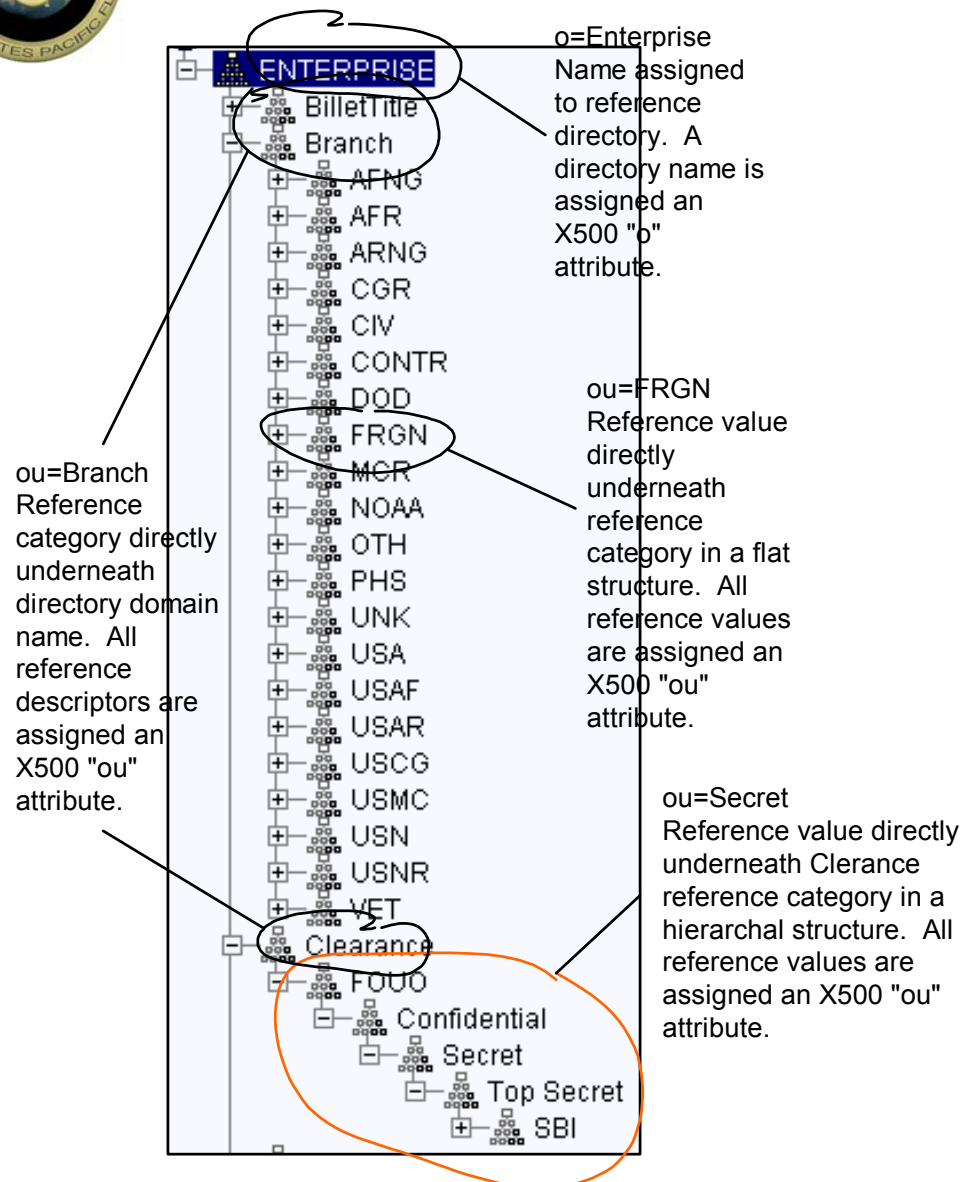


Customer Meta-Database(s)





Customer meta-database specifications

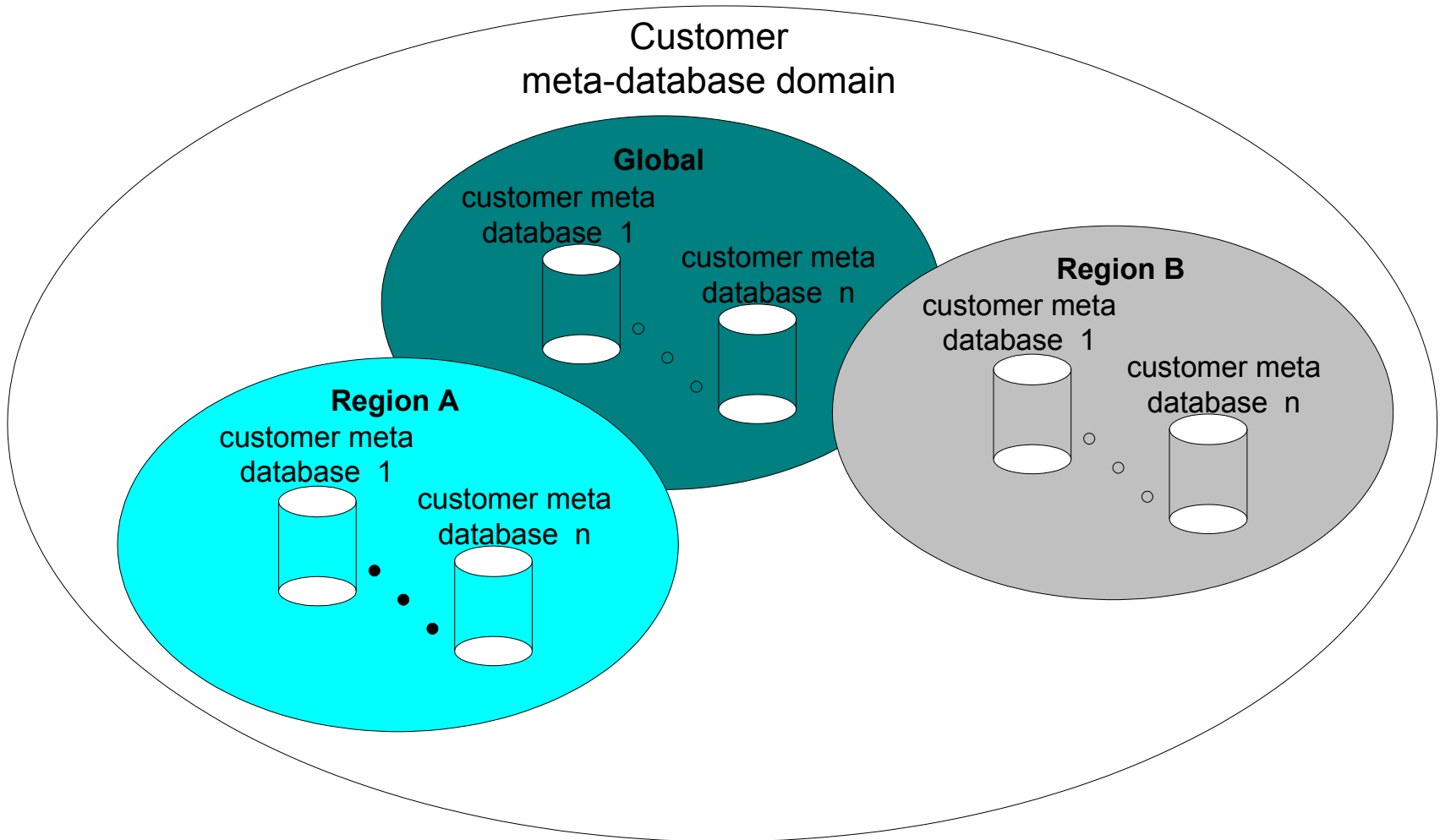


- Customer meta-database
- LDAP v 3/DSML directory
- X500 class objects
 - organization
 - organizationalUnit
- Scalable
 - unlimited entries
 - modifications allowed
- Structure designation
 - domain
 - reference category
 - values
- Structure
 - flat
 - hierarchal
- Maintained
 - local commands
 - regional commands



Customer meta-database domain

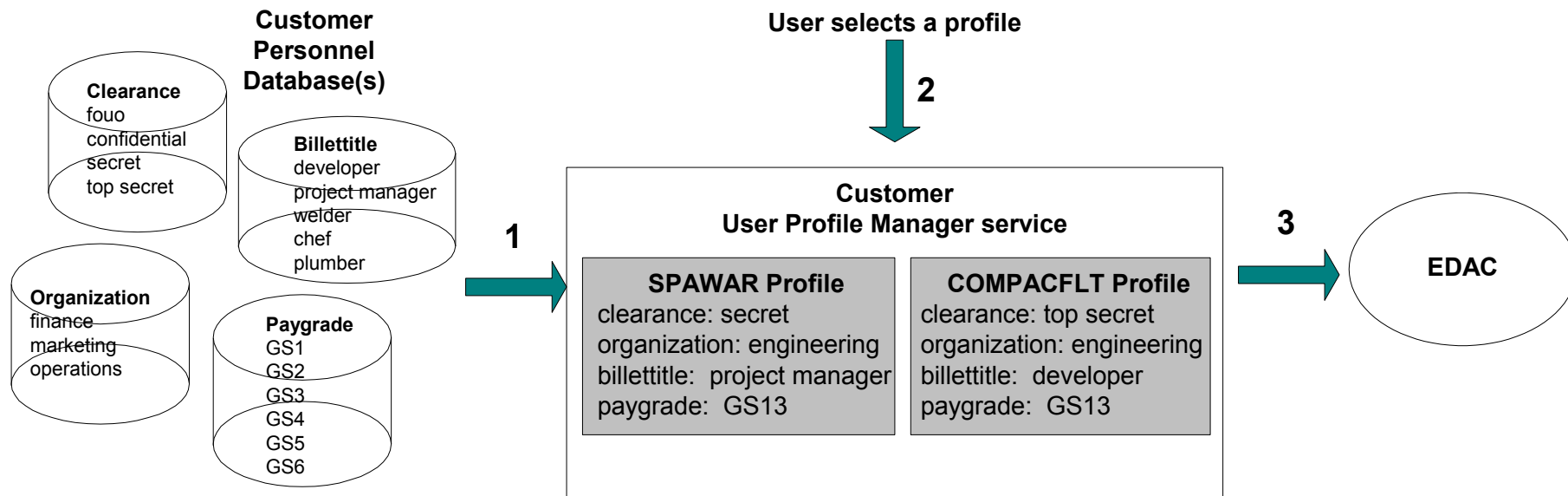
Domain consist of global and regional directories.





User Profile Manager

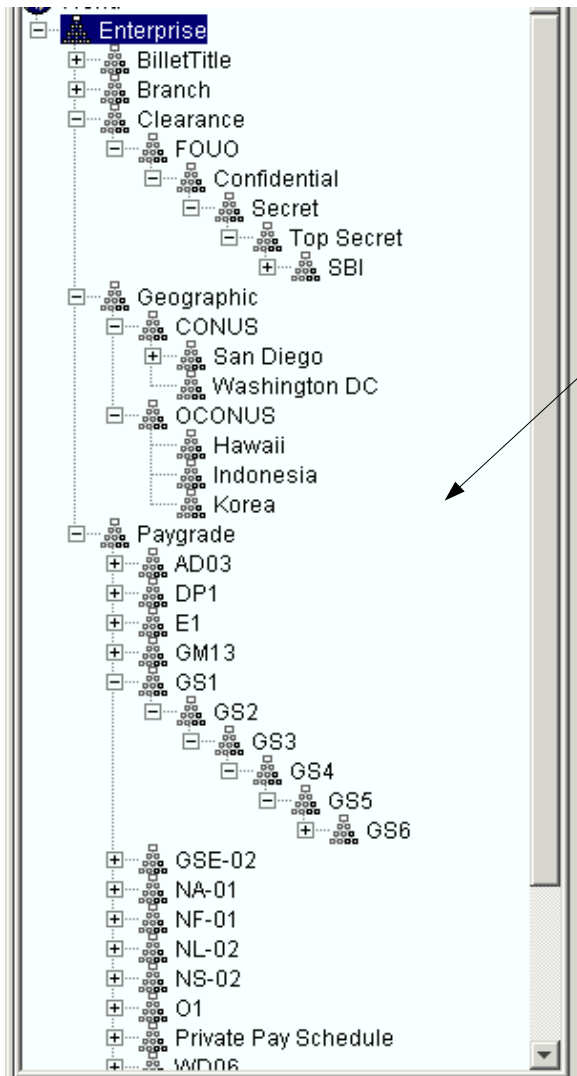
User selects a profile to determine resource access.
Mgmt constraints on user profile selections





How the EDAC works

Customer Meta-Database



RBAC Condition Manager



Step 1:

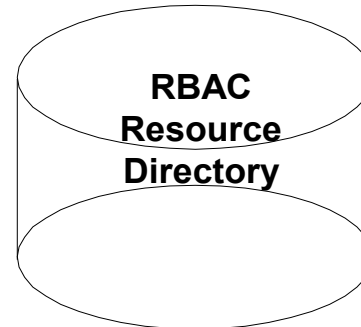
Resource manager establishes a set of conditions to access a resource.

These set of conditions represent a **resource profile**.

Resource Profile

✔ ou=N65, ou=N6, ou=CPF, ou=assignedCommand, o=CPF
✔ ou=secret, ou=confidential, ou=fouo, ou=clearance, o=Enterprise

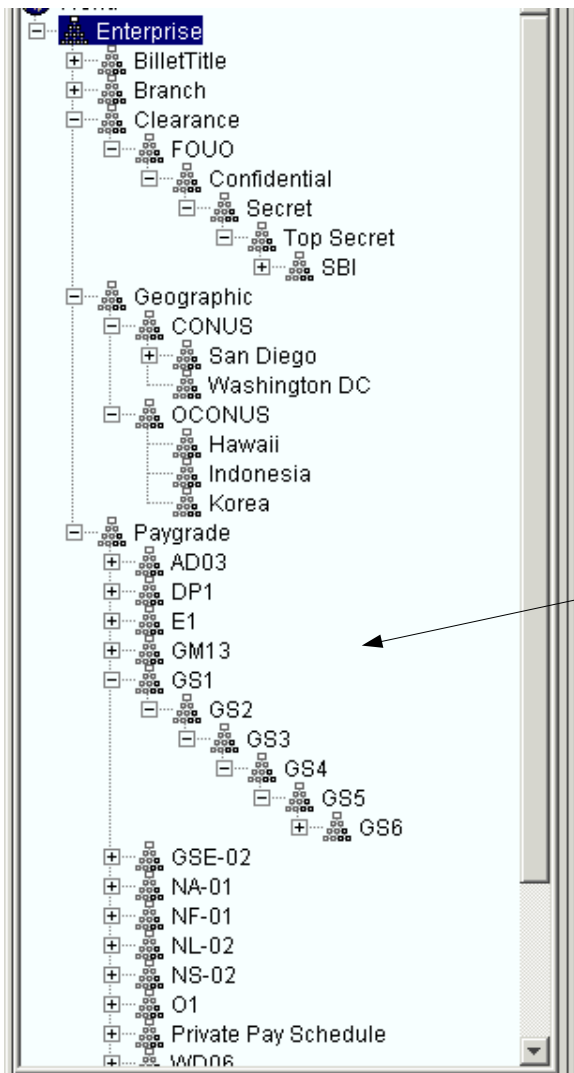
RBAC Resource Directory





How the EDAC works

Customer Meta-Database



Customer User
Profile Manager
Interface



Structure
Format
Service

Step 2:

An effective RBAC requires real-time creation of user profile(s) from authoritative data source(s).

Customer Personnel
Database

Reference Categories	Attributes
assignedCommand	N65
clearance	Secret
paygrade	GS3

User Profile

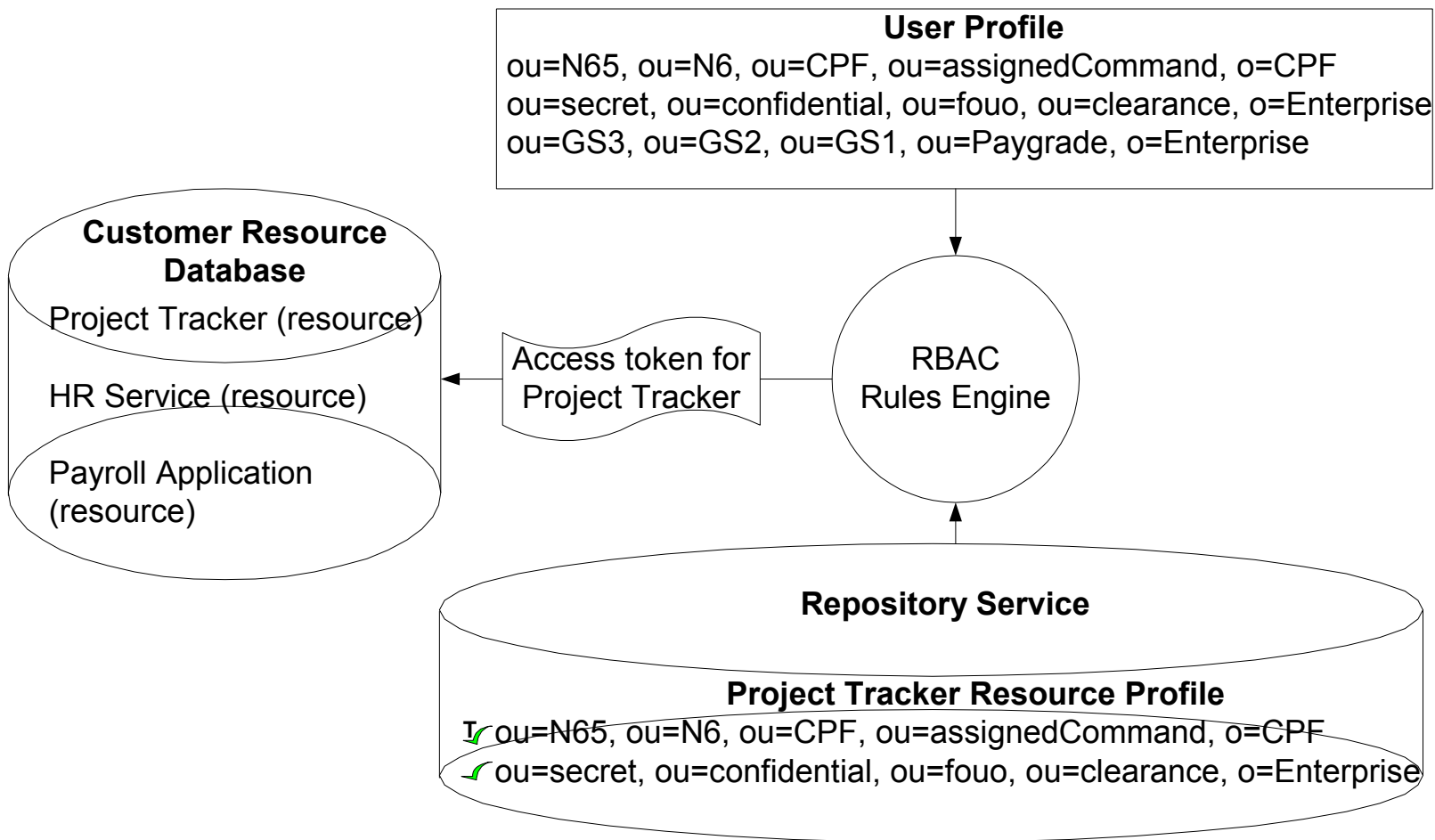
ou=N65, ou=N6, ou=CPF, ou=assignedCommand, o=CPF
ou=secret, ou=confidential, ou=fouo, ou=clearance, o=Enterprise
ou=GS3, ou=GS2, ou=GS1, ou=Paygrade, o=Enterprise



How the EDAC works

Step 3:

The RBAC Rules Engine compares User and Resource Profiles to determine resource access.





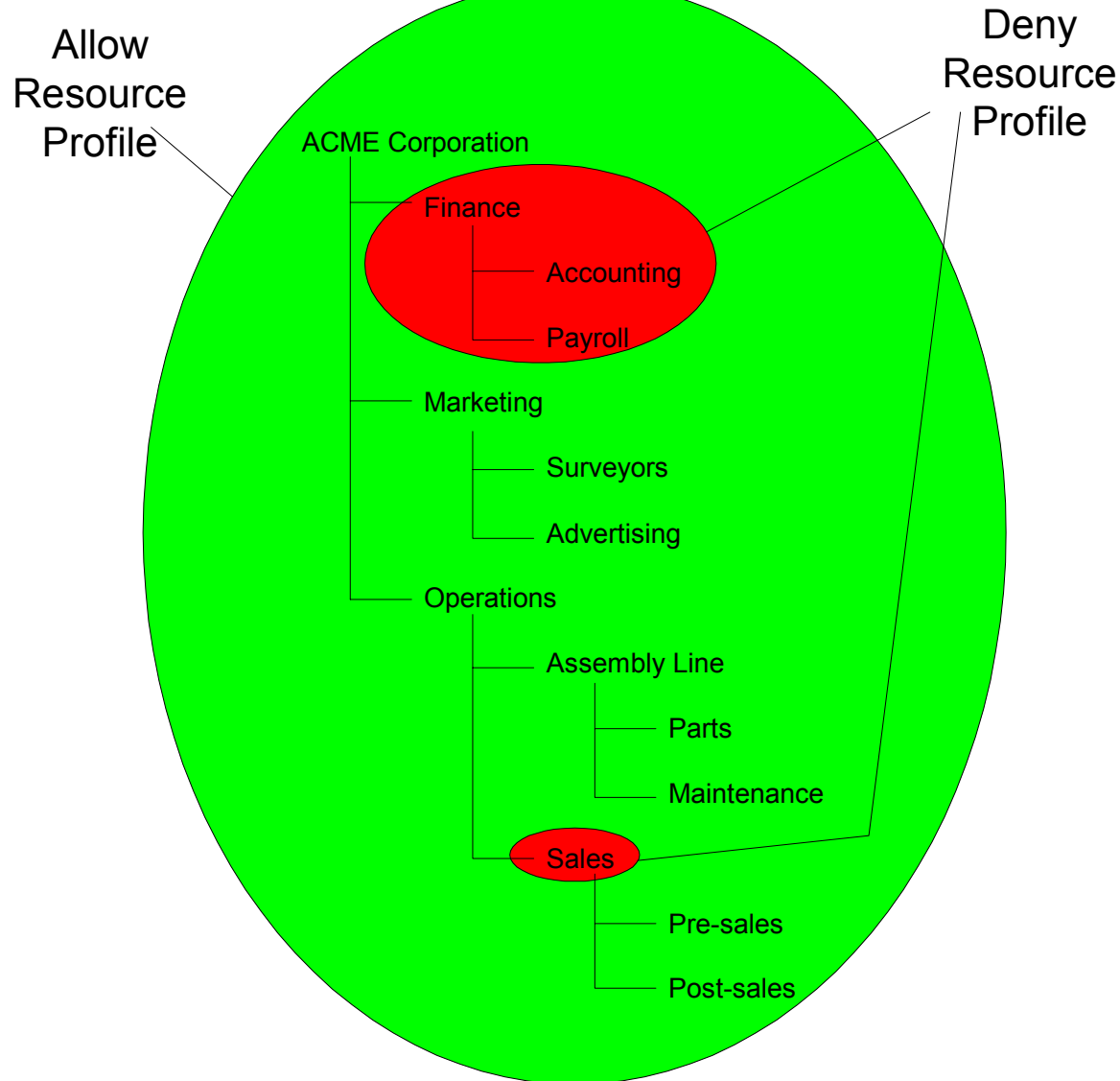
EDAC – Resource profiles

Resource Roles for Project Tracker	Resource Profiles		
Guest	CPF Guest T ✓ COMPACFLT	CSP Guest T ✓ COMSUBPAC ✓ DoD	CNR Guests T ✓ COMNAVREG  Tuesdays 1700 -2300
User	CPF N6 Users T ✓ CPF N6 T ✓ GS12  Mon & Thurs 0800 -1300	Deny Contr Users T ✗ CPF N6 ✗ Secret ✗ CONTR	
Administrator	CPF Admin ✓ CPF N65 T ✓ TS	Deny CPF N65 Admin T ✗ CPF N65 ✗ CONTR  Mon & Thurs 0800 -1300	

- Resource roles
- Allow & Deny profiles
- Exact and subtree conditions
- Time constraints



EDAC – Resource profiles





EDAC – Security levels

During INFOCON B

INFOCON A	Guest	CPF Guest	CSP Guest	CNR Guests
INFOCON B	User	CPF NB Users	Deny CNR Users	
INFOCON C	Admin	CPF Admin	Deny CPF NIS Admin	
INFOCON D	Guest	CPF Guest	CSP Guest	CNR Guests
INFOCON E	User	CPF NB Users	Deny CNR Users	
INFOCON F	Admin	CPF Admin	Deny CPF NIS Admin	

During INFOCON C

INFOCON A	Guest	CPF Guest	CSP Guest	CNR Guests
INFOCON B	User	CPF NB Users	Deny CNR Users	
INFOCON C	Admin	CPF Admin	Deny CPF NIS Admin	
INFOCON D	Guest	CPF Guest	CSP Guest	CNR Guests
INFOCON E	User	CPF NB Users	Deny CNR Users	
INFOCON F	Admin	CPF Admin	Deny CPF NIS Admin	

- Pre-configure conditions under each security level.
- RBAC Rules Engine evaluates only conditions for prevailing security level.



EDAC – Model

EDAC standard initiative:

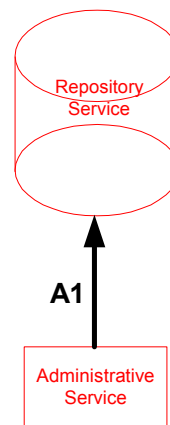
- Interchangeable modular access control components
- Minimum salient features
- Protocol between components
- Standard tie-ins between customer assets and access control system



EDAC - Model

Customer furnished and
maintained assets

Enterprise Dynamic
Access Control (EDAC)

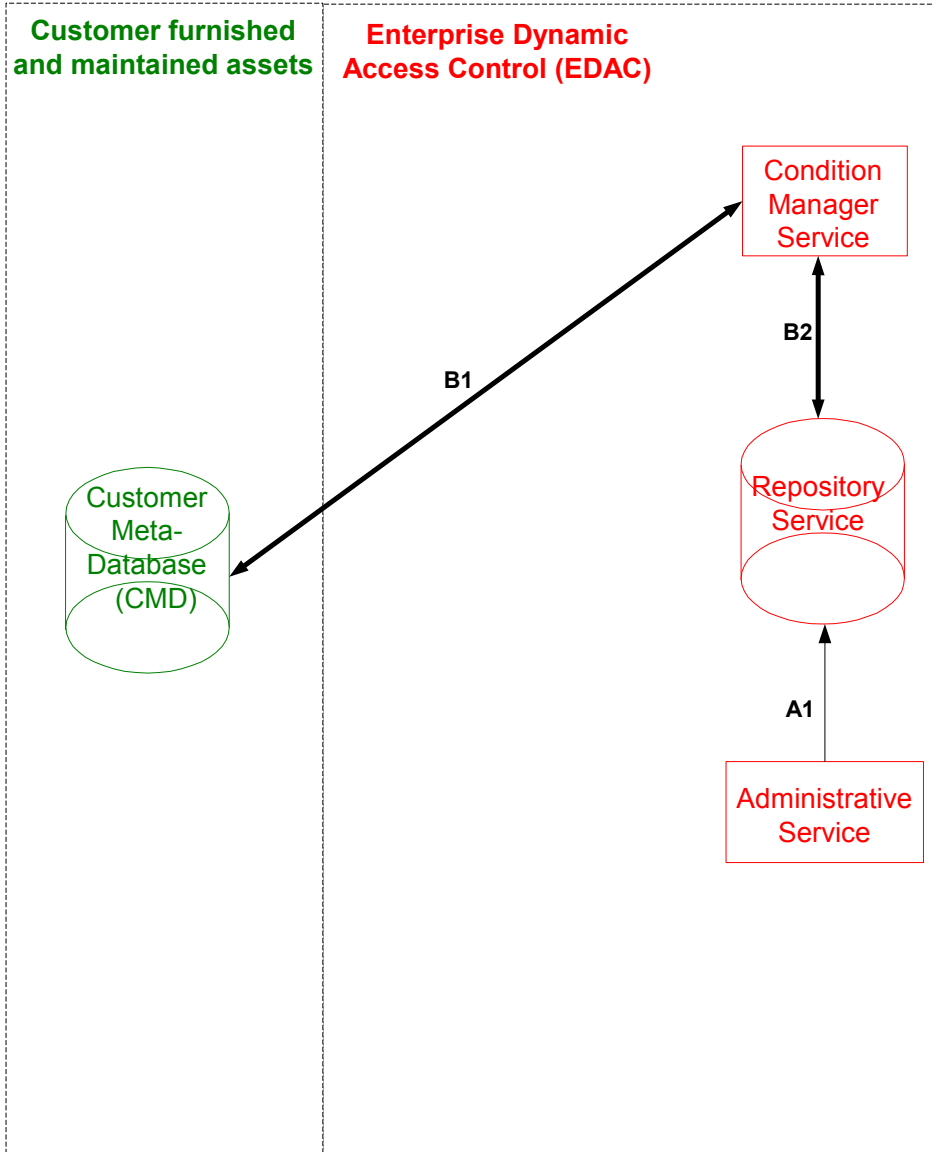


EDAC Process

(A) Administrative Service -
establishes resource
containers, CMD referrals,
RM accounts.



EDAC - Model



EDAC Process

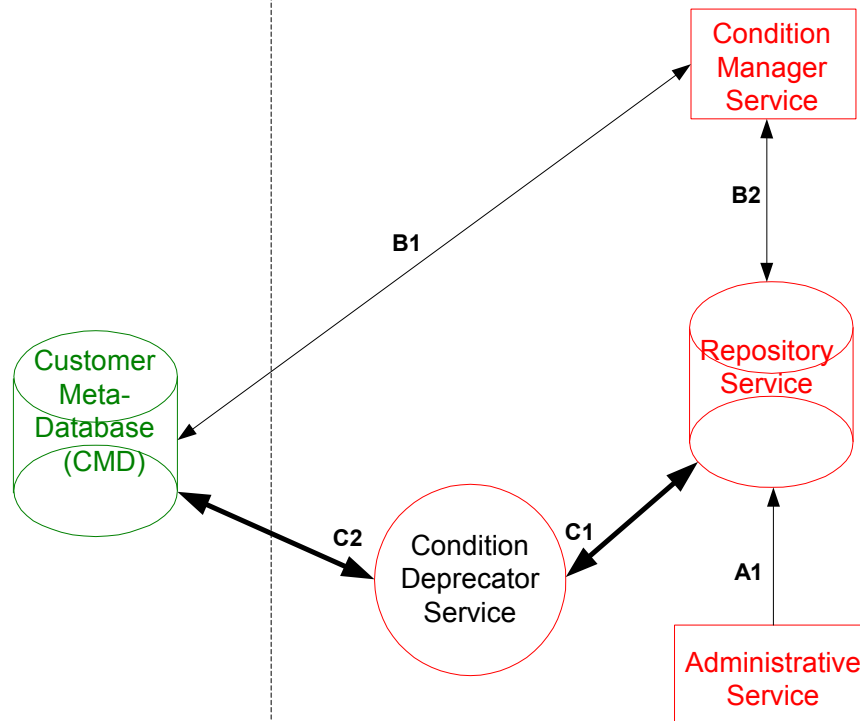
(B) Condition manager Service - Establishes and edits conditions to access resources.



EDAC - Model

**Customer furnished
and maintained assets**

**Enterprise Dynamic
Access Control (EDAC)**



EDAC Process

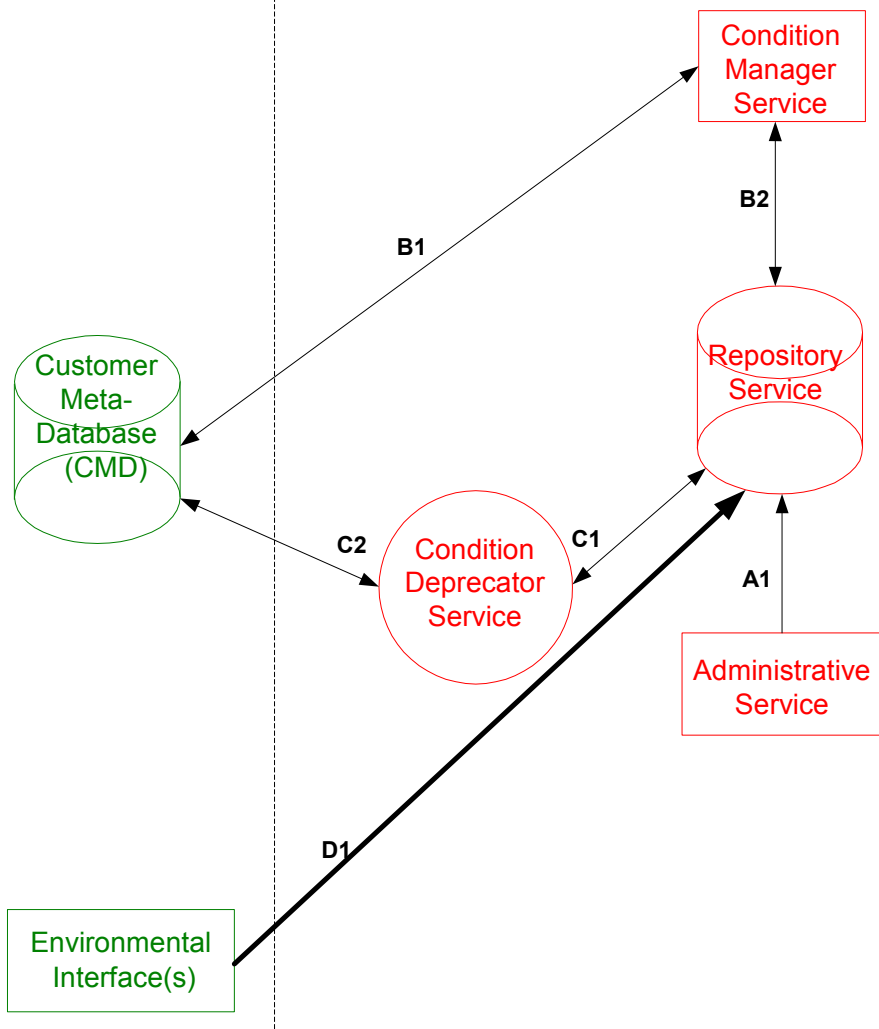
(C) Condition deprecator Service - listens for CMD content changes and flags unmatched or unreachable conditions.



EDAC - Model

**Customer furnished
and maintained assets**

**Enterprise Dynamic
Access Control (EDAC)**

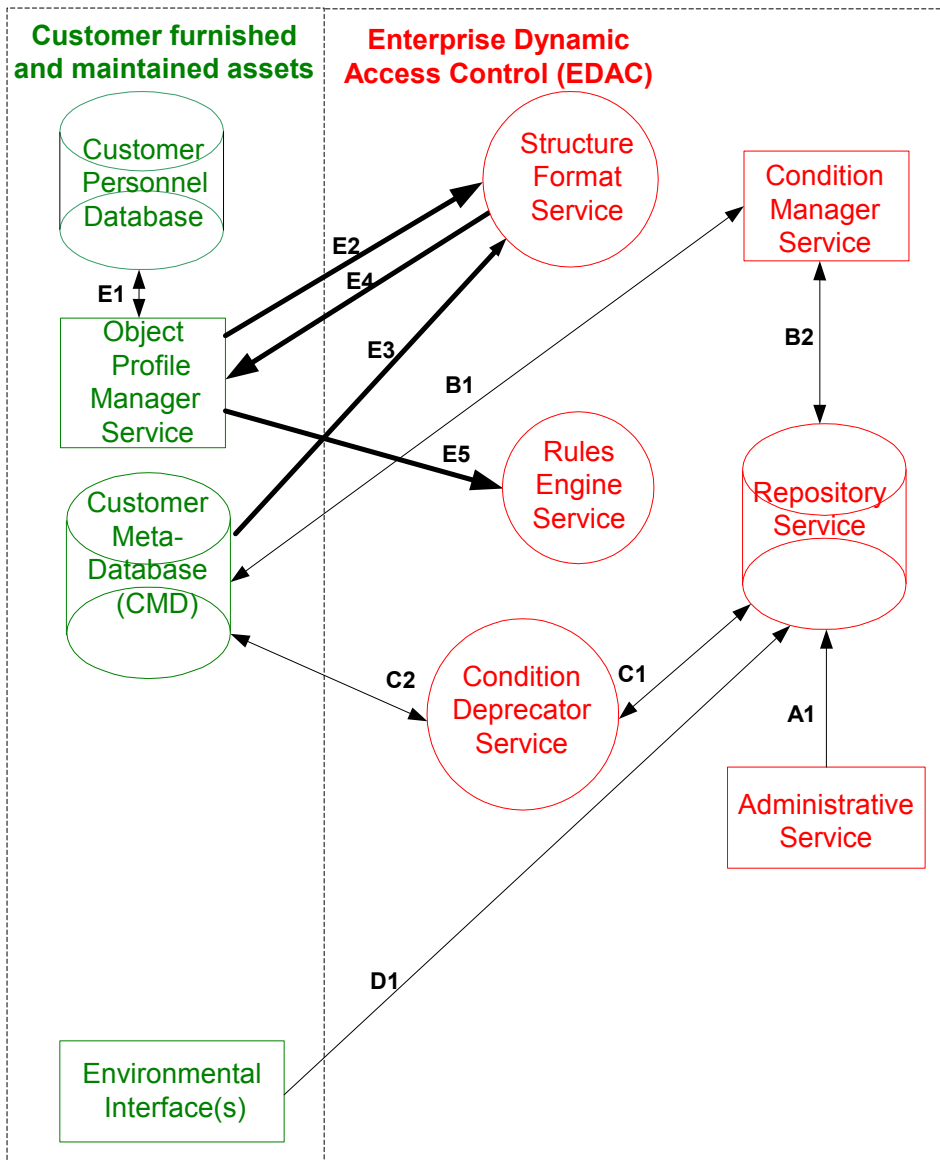


EDAC Process

(D) Customer
Environmental Interface
- furnishes
environmental updates.



EDAC - Model

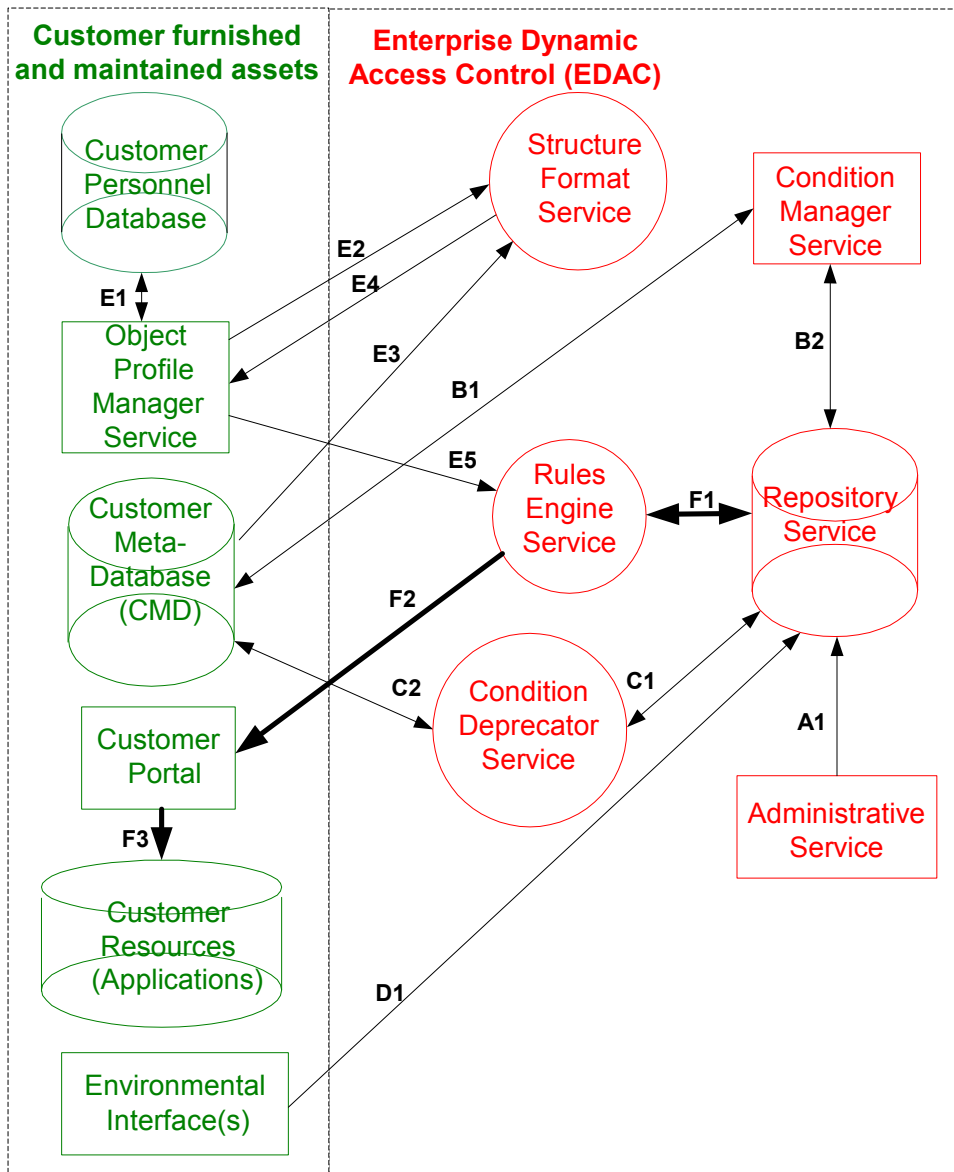


EDAC Process

(E) Customer Object profile manager Service
- object characteristic compilation, selection and formatting.



EDAC - Model



EDAC Process

(F) Rules Engine Service - evaluates object and conditions to determine object resource access.



EDAC – Interoperability

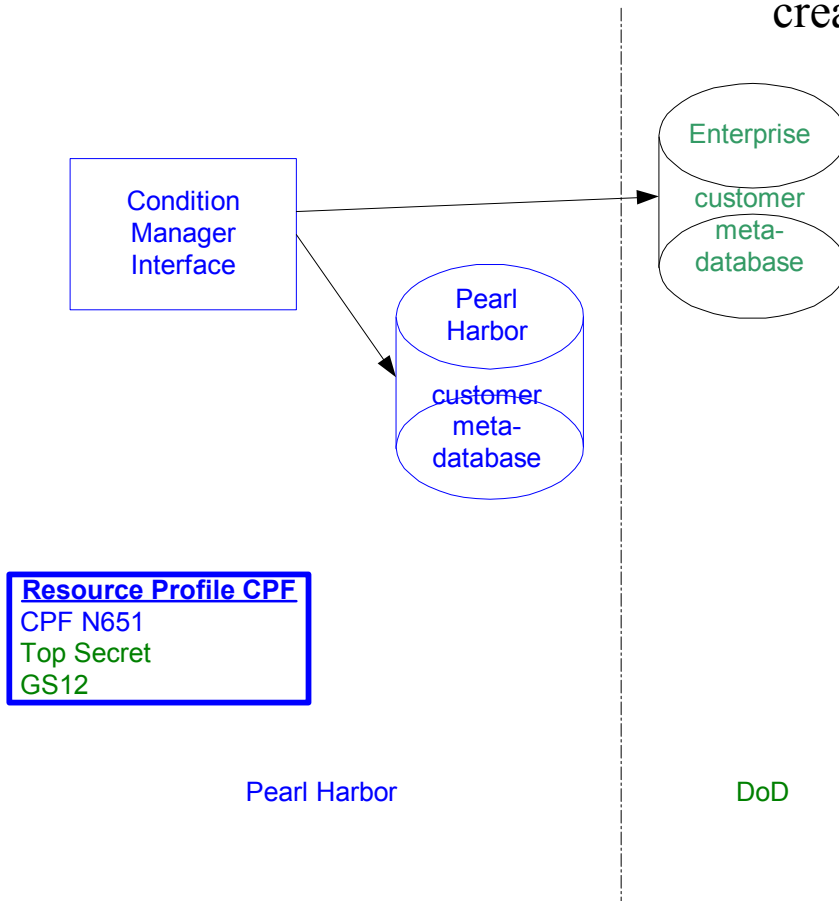
EDAC interoperable among regions:

- Set conditional access for remote users
- Domain customer meta-databases



EDAC - Interoperability

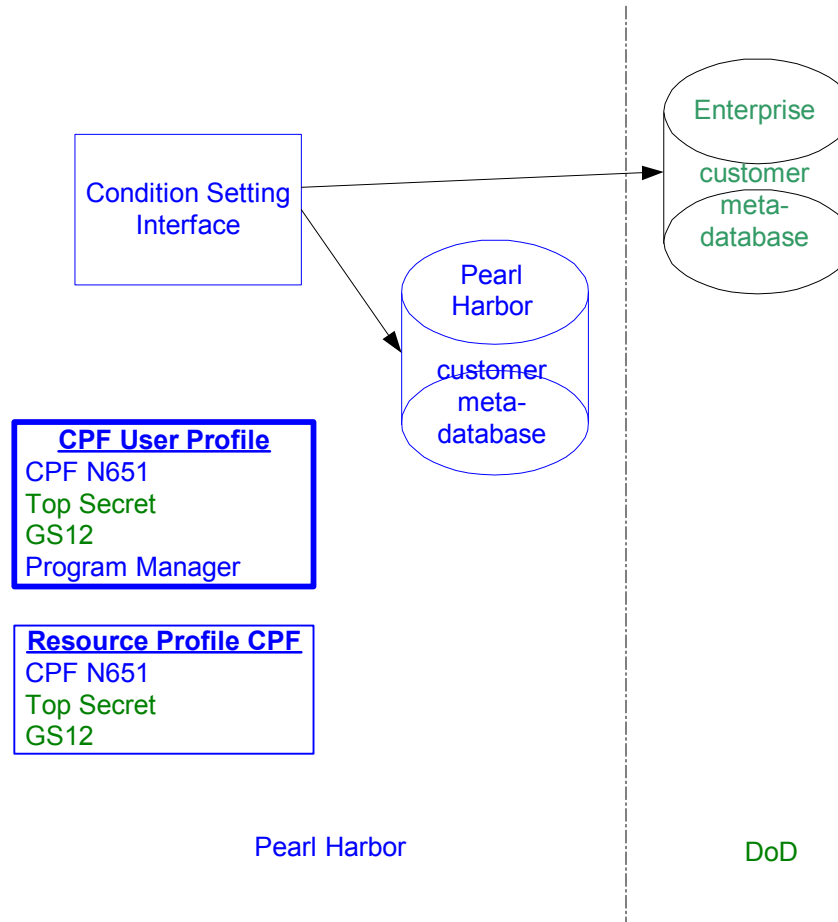
Pearl Harbor: resource profile created for local resource access.





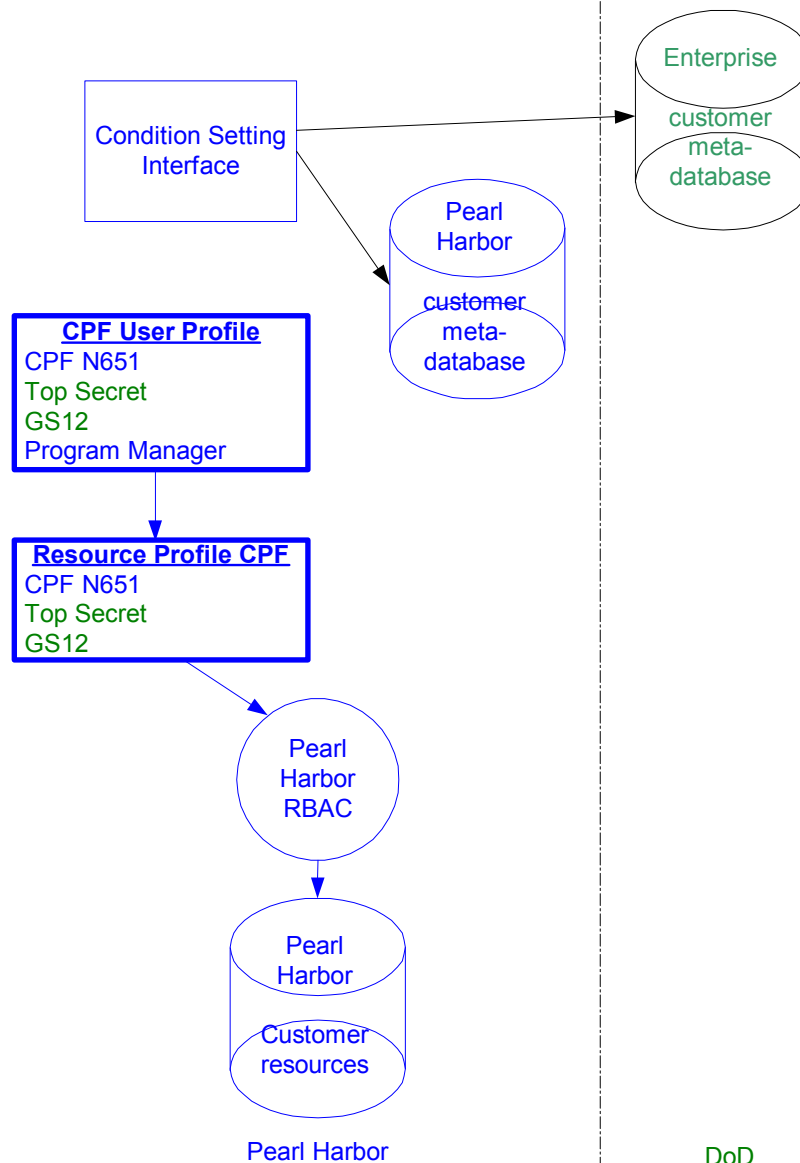
EDAC - Interoperability

Pearl Harbor: local user profile is generated to access a local resource.





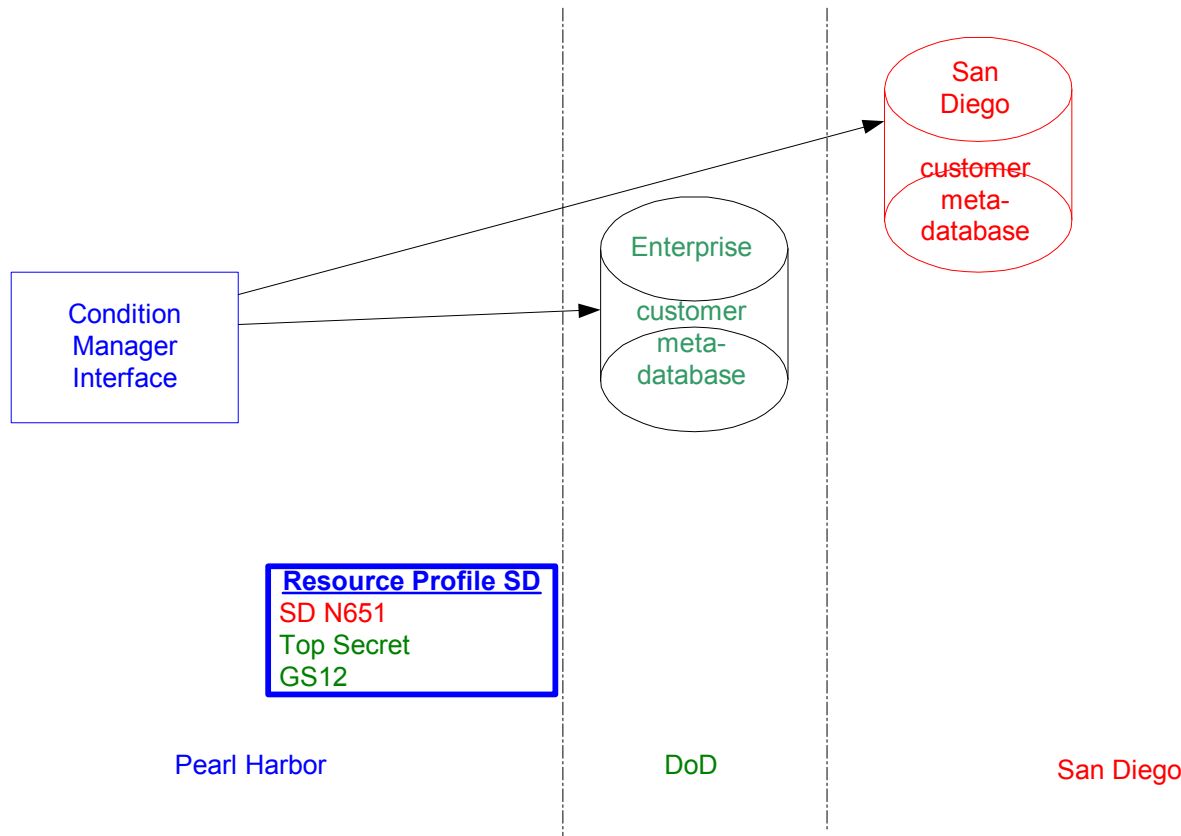
EDAC - Interoperability



Pearl Harbor: user and resource profiles are evaluated by rules engine to determine local resource access.



EDAC - Interoperability

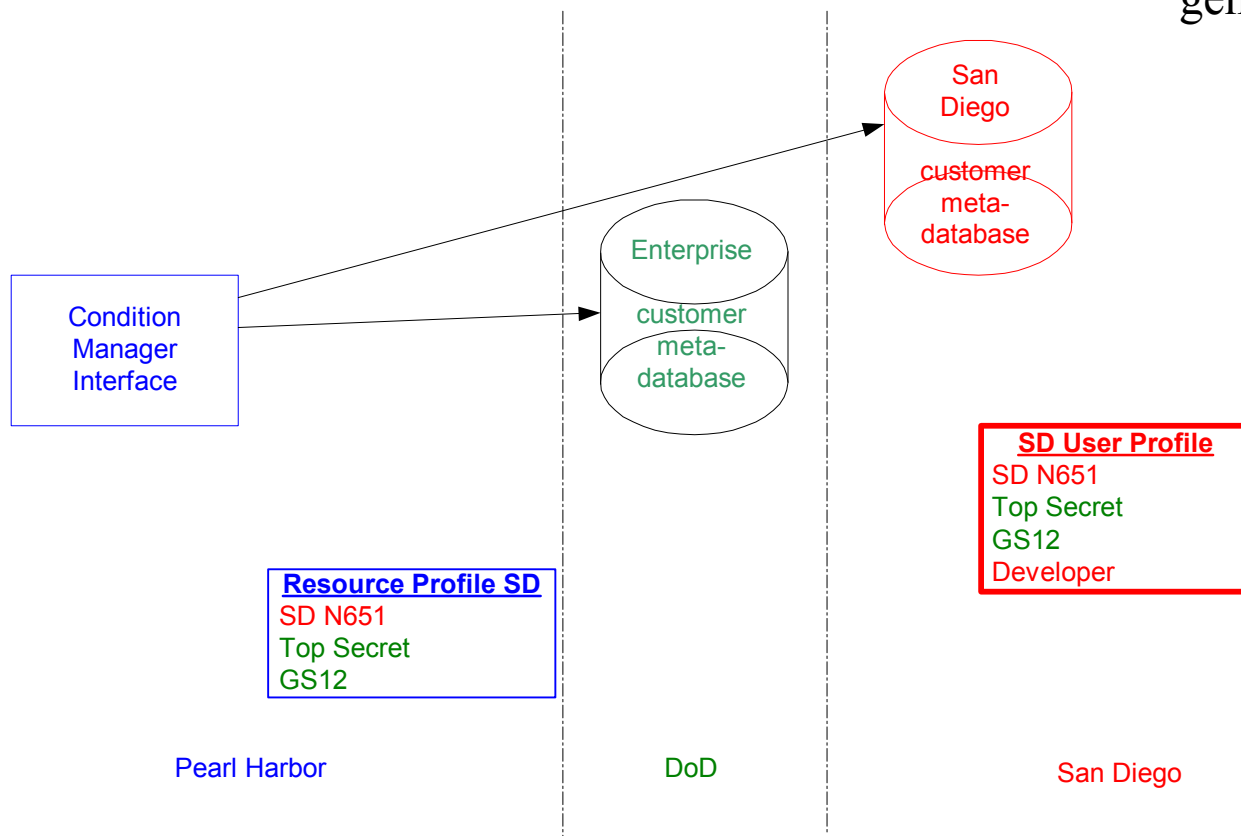


Pearl Harbor: A resource profile to allow remote users access to local resources.



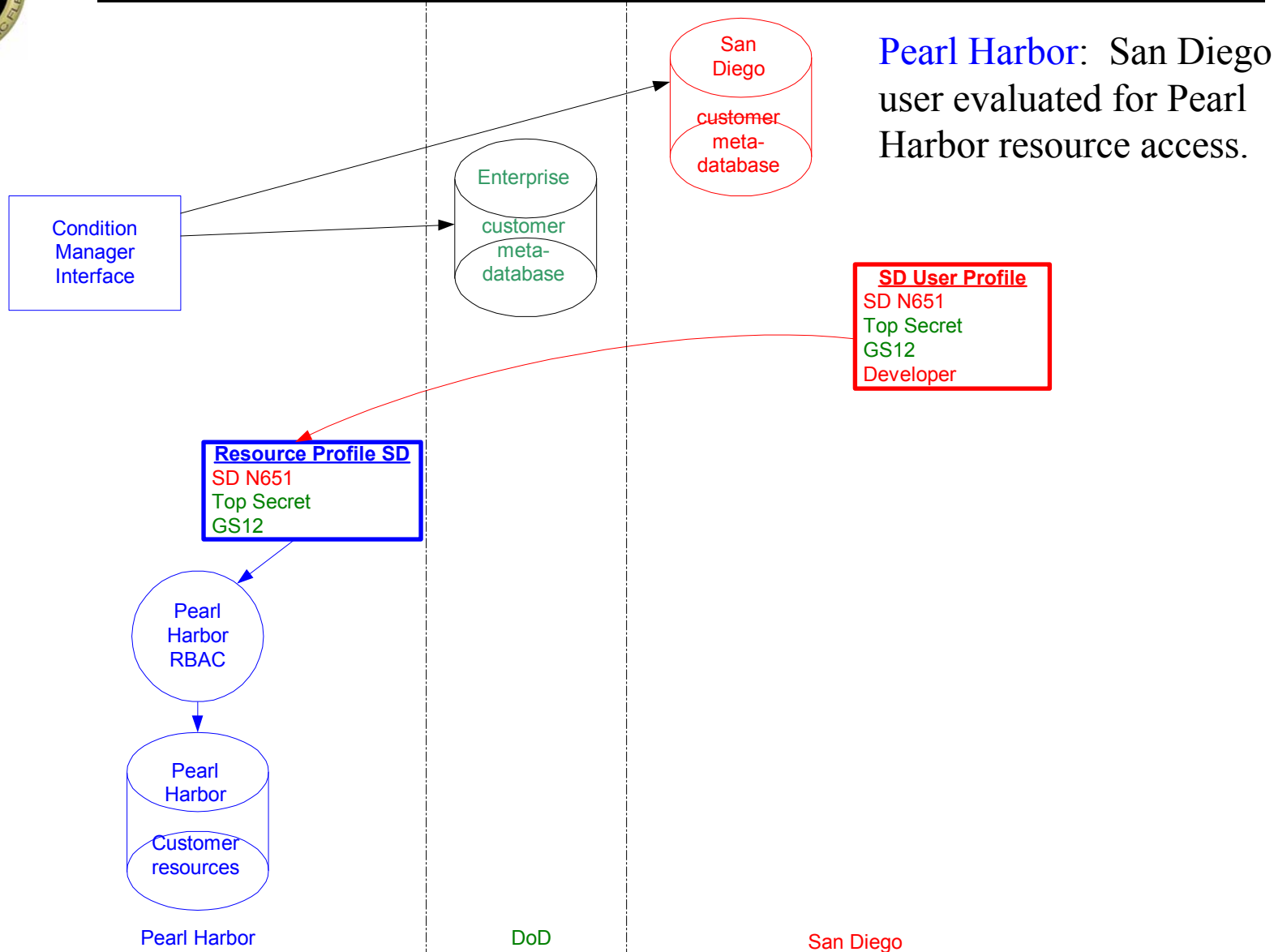
EDAC - Interoperability

San Diego: user profile generated.





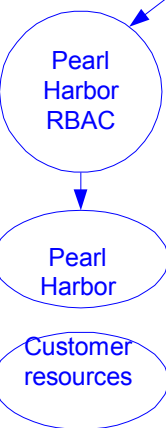
EDAC - Interoperability



Pearl Harbor: San Diego user evaluated for Pearl Harbor resource access.

SD User Profile
SD N651
Top Secret
GS12
Developer

Resource Profile SD
SD N651
Top Secret
GS12



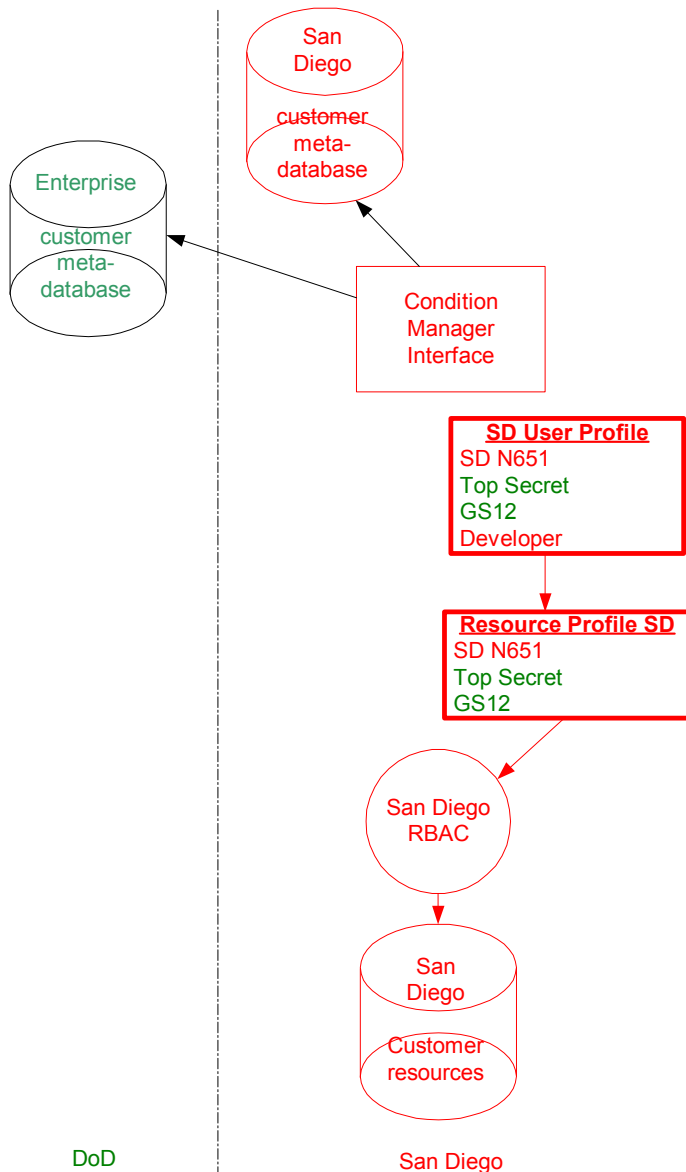
Pearl Harbor

DoD

San Diego



EDAC - Interoperability



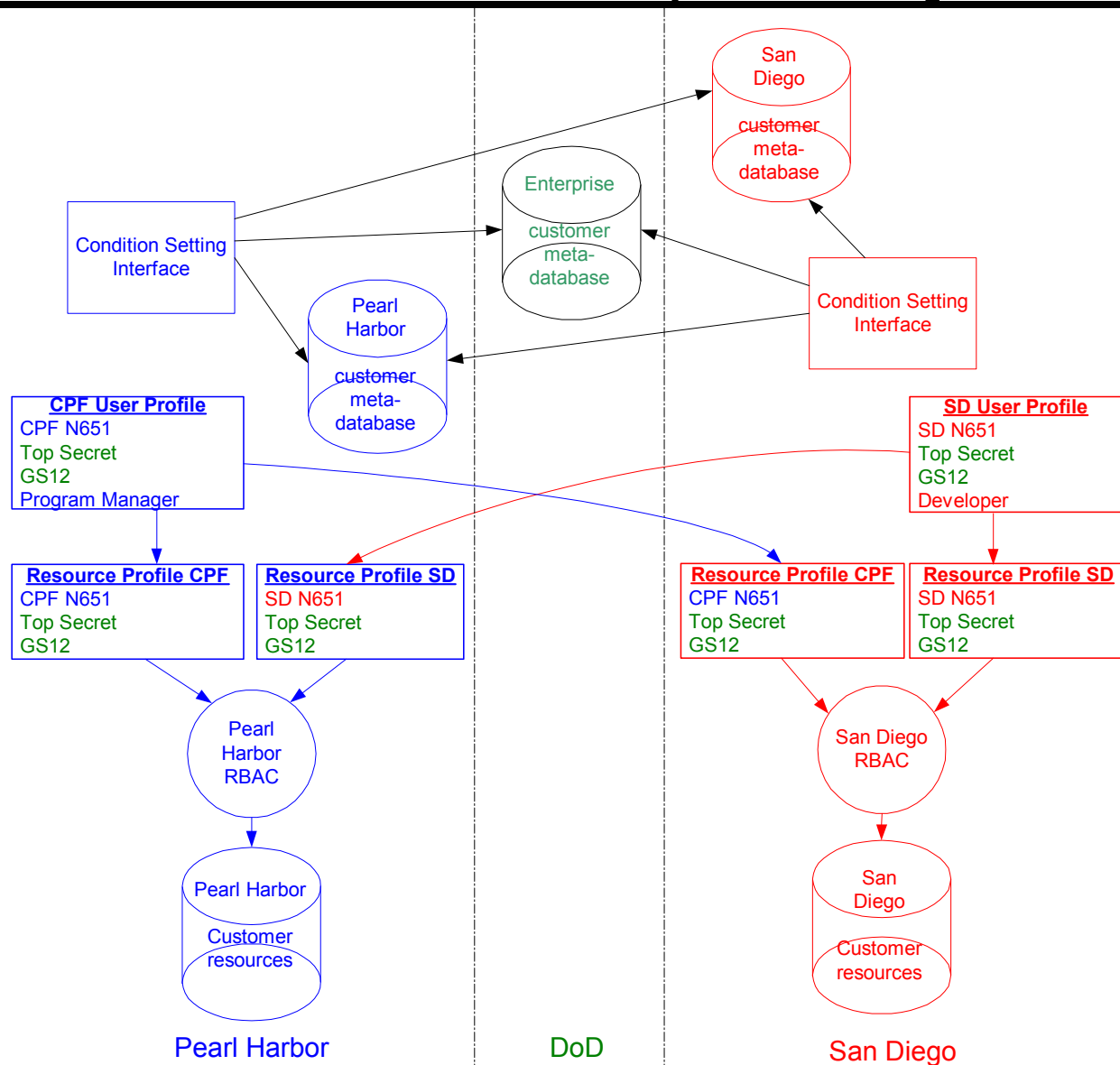
San Diego: same user evaluated for San Diego resource access.

DoD

San Diego



EDAC – Interoperability



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