Integrating Applications into UCAR Authentication and People DB Services Utilizing REST APIs

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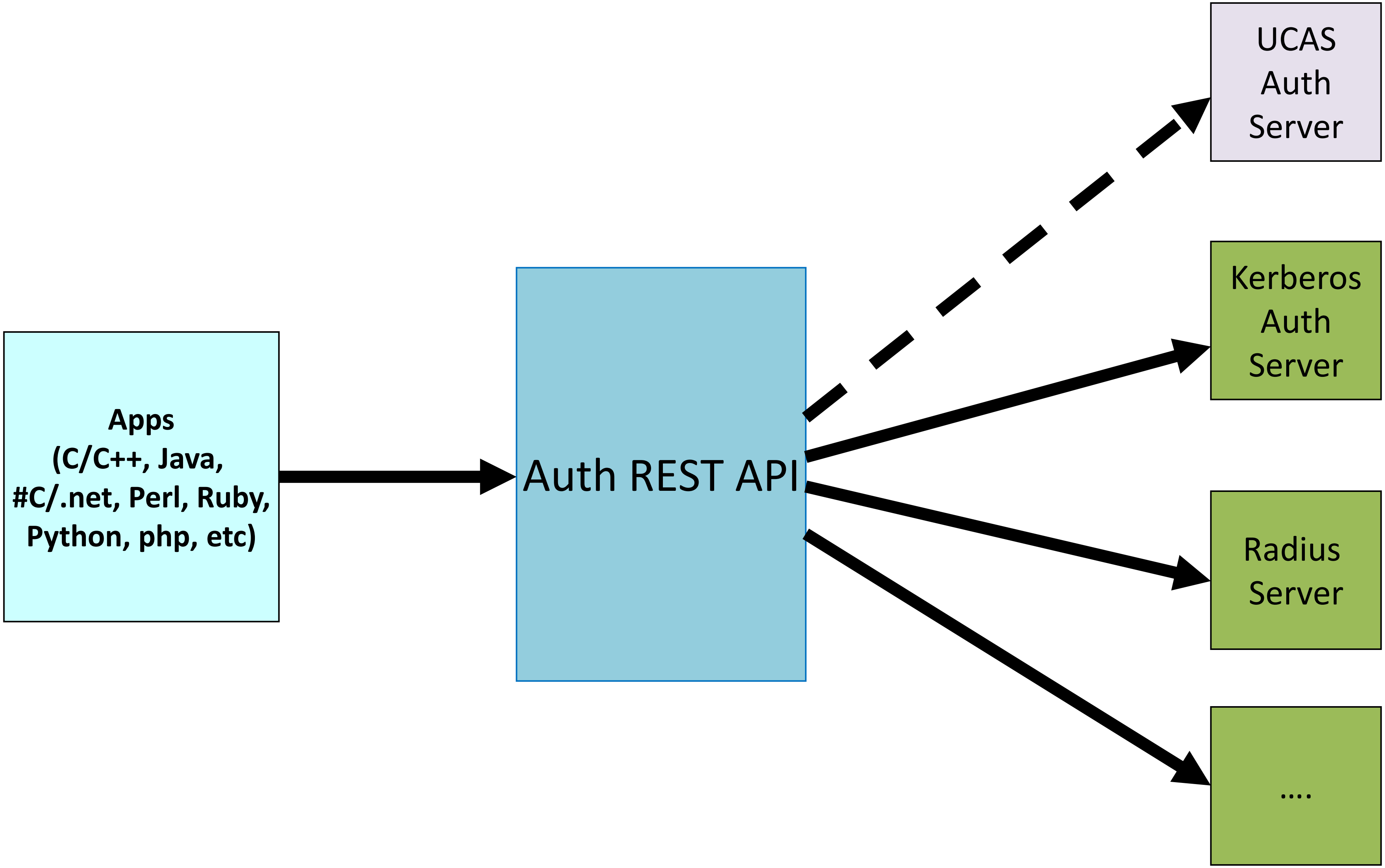
Topics for Today

- Brief introduction to RESTful Web Services
- Auth REST APIs
- People DB
- People REST APIs

What is REST API?

- REST API a.k.a RESTful Web Services
- In REST API
  - URLs are used to identify the object for the operation
  - Standard HTTP methods such as GET, PUT, DELETE are used to represent the operations
  - Params in URLs are used as parameters for the method on the server
  - Data are transferred directly on HTTP body

Auth REST API - Architecture



Apps
(C/C++, Java, #C/.net, Perl, Ruby, Python, php, etc)

Auth REST API

UCAS Auth Server

Kerberos Auth Server

Radius Server

....

Auth REST API - Benefits

- REST API essentially acts as a proxy to the auth servers
- It hides the complexity to access the auth servers from the application
- When auth servers change, none or minimum changes will be needed by the applications
  - Example, When UCAS auth server is replaced by Keberos, no change was needed by the apps.

How to Use Auth REST API

- URL

  https://auth.api.ucar.edu/authenticator/rrh/authentication
- Credentials

  Login and Password
- HTTP Method

  HTTP Put
- HTTP Body

```
{
      "authType":"password",
      "username":"bsun",
      "password":"bsun"
}
```

How to Use REST API - Continued

- HTTP Response Code

  200 - Ok response

  401 – invalid credetials

  403 – invalid URL path

  500 – Server Error. Error message will be contained in HTTP Body

- HTTP Response body

```
{
    “username”:<User Login>,
    “valid”:”true“ or “false”
    “firstName”:<User First Name> ,
    “lastName”:<User Last Name>
}
```

Auth REST API Example - python

```
def authenticate(url, authType, username, password):
    http=httplib2.Http()
    authentication={'authType': authType, 'username': username, 'password':password}
    http.add_credentials('admin','admin')
    headers = {'Content-type': 'application/json'}
    response, content = http.request(url, 'PUT', headers=headers,
    body=demjson.encode(authentication))
    status = response.status
    if status == 200:
        authentication=demjson.decode(content)
        return authentication['valid']
    if status == 401:
        print 'Invalid credentials for Auth Web Service Server'
    if status == 500:
        print 'Server error'
        print content
```

Auth REST API Example - Java

- Write your own client
- Use WEG provided client

```
try  {
    Authentication auth=AuthClient.getAuthentication
            ("token", <username>, <yubikey or cryptal card token>);
    if (auth.isValid()) {
      // do things for successful authentication
    else
      //do things for failed authentication
 }
catch (AuthClientException ex) {
    //handle exception
}
```

Auth REST API – Integration with 3rd apps

- WEG provides libs to integrate with 3rd party apps such as Jira and Confluence.

Auth REST API – Docs & sample codes

- https://wiki.ucar.edu/display/weg/Auth+REST+API

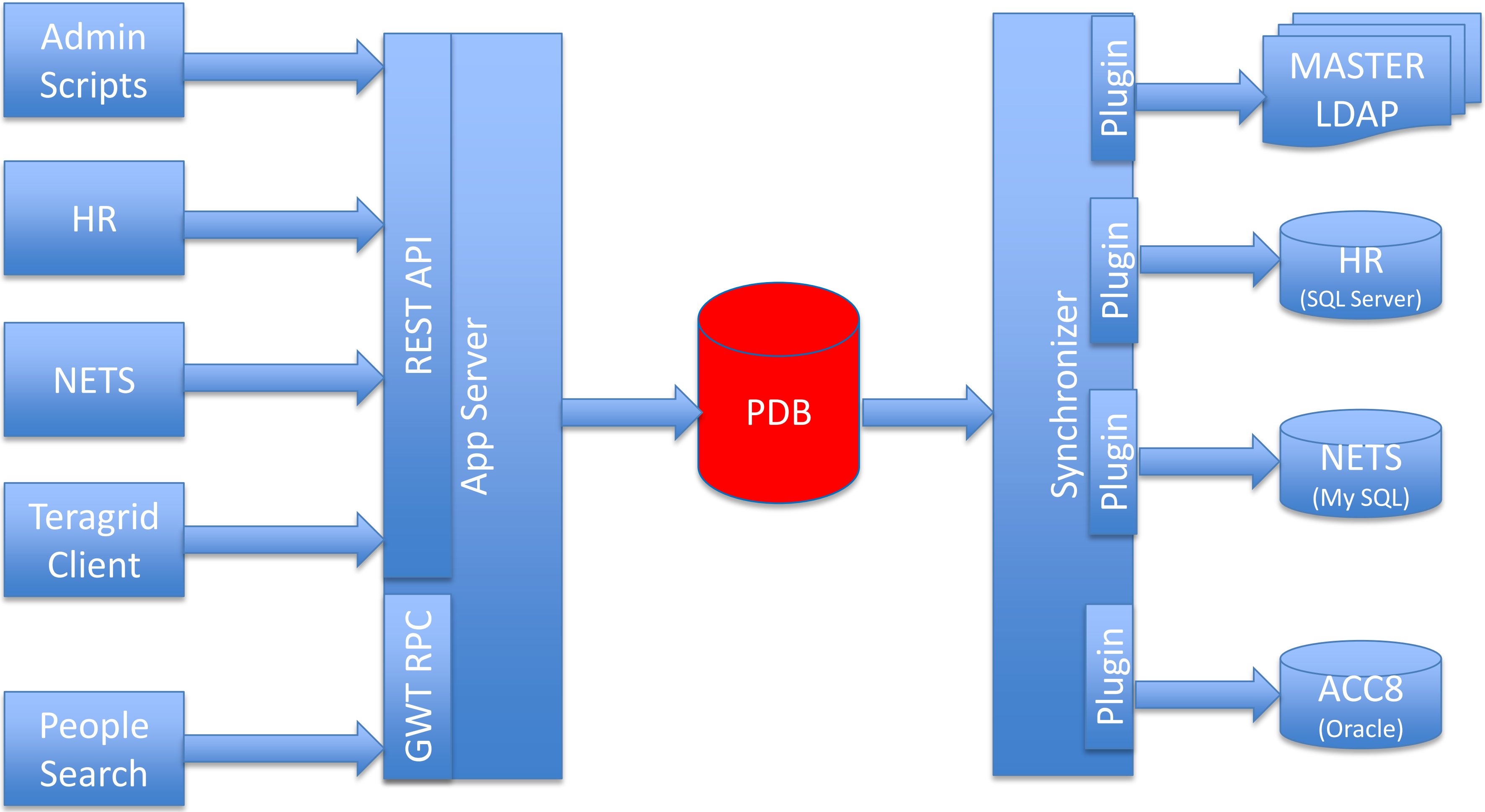
Auth REST API

- Questions?

People DB 2.0

- Bring together UCAR master metadata about people/groups/orgs into a federated service
  - Staff, visitors, collaborators
  - UCAR organizations
  - External organizations
  - Groups
  - Alias, mailbox, mailman list
  - Locations (ISO countries, ISO states, Buildings)
- Honor who is the authoritative source for the data
- Role based permission model to control who can change what
- Use Synchronizer to push data changes to down stream data consumers at real time

People DB 2.0 - Architecture



4 ways to access PDB data

- Use master LDAP
  - read only
- Subscribe to Synchronizer to have data pushed to your own data store in real time
  - read only
- Direct access to People DB (MySQL) using SQL
  - read only, not recommended
- Use People REST APIs
  - read and write

People REST APIs - WADL

- WADL (Web Application Description Language)
  - like WSDL in SOAP
  - simply GET the resource /application.wadl at the base URI
  - https://tmerapi:8203/api/application.wadl

People REST APIs -public

- Search External Persons (Collaborators)
- Get External Person (Collaborator) Detail Data
- Search Internal persons (UCAR Staff and Visitors)
- Get Internal Person Detail 2.0
- Search Persons 2.0
- Get Person Data

- Search Organizations 2.0
- Get Organization Detail 2.0
- Get Organization Hierarchy 2.0
- Get Sub Organizations 2.0

People REST APIs - Restricted

- Search Groups
- Add or Update Group
- Delete Group
- Add or Update Group Admins
- Get Group Detail Data
- Check if a person or a group or an org has permission for a group
- Get Group Admins

- Add Or Update External Organization
- Get External Organization Data
- Delete External Organization

- Add Or Update Mailbox
- Get Mailbox Detail Data
- Delete Mailbox

- Add Or Update Mailman List
- Get Mailman List Detail Data
- Delete Mailman List

- Add or Update UCAR Organization Admins
- Check if a person is an admin for another person
- Check if a person is an admin for a UCAR organization

- Get Building Data

People REST APIs – Public

- **<base URL>/<collection name>?param1=value1&param2=value2**
  - HTTP Method: GET
  - Used for Search
  - Example: https://tmerapi:8203/api/persons?name=mark
- **<base URL>/<collection name>/<id>**
  - HTTP Method: GET
  - Used for Getting detail data for an object
  - Example: https://tmerapi:8203/api/persons/bsun
- **Docs & sample codes**
  - https://wiki.ucar.edu/display/weg/People+REST+API+2.0+core+services

People REST APIs – Restricted

- **<base URL>/protected/admin/<collection name>?param1=value1&param2=value2**
  - HTTP Method: GET
  - Used for Search
  - Example: https://tmerapi:8203/api/protected/admin/groups?name=cisl
- **<base URL>/protected/admin/<collection name>/<id>**
  - HTTP Method: GET, PUT, DELETE
  - Used for Retrieving Data for an object, Add/Update an object, and Delete an object
  - Example: https://tmerapi:8203/api/protected/admin/groups/bruceGroup

People REST APIs – Restricted continued

- **For each resource, usually there are four APIs:**
  - **Search**
    - **HTTP GET**
    - https://tmerapi:8203/api/protected/admin/groups?name=cisl
  - **Add or Update:**
    - **HTTP PUT**
    - https://tmerapi:8203/api/protected/admin/groups/bruceGroup
  - **Get Detail Data**
    - **HTTP GET**
    - https://tmerapi:8203/api/protected/admin/groups/bruceGroup
  - **Delete Data**
    - **HTTP DELETE**
    - https://tmerapi:8203/api/protected/admin/groups/bruceGroup
- **Docs & Sample codes**

  https://wiki.ucar.edu/display/weg/People+REST+APIs+for+admins

People REST APIs – Search People

- Search internal persons (staff & visitors)
  - Backward compatible with PDB 1.0
  - E.g. https://tmerapi:8203/api/internalPersons?name=sun
- Search external persons (collaborators)
  - https://tmerapi:8203/api/externalPersons?adminOrg=mmm
- Search persons (staff, visitors & collaborators)
  - Provide the same search functionality as in People Search Interface
  - Supports a lot of parameters
  - Best way to construct URL is to build search in the interface, then copy/paste everything after ? In URL to Person search api: https/tmerapi:8203/api/persons?

People REST APIs – Groups

- Group Members
  - Individuals
  - Sub groups
  - Orgs
  - SQLs
  - REST APIs (in 2.1d)
- Group can be used as email alias
  - Mailboxes
  - External emails
- Group data will be sync-ed to LDAP for authorization at real time.

Demo

- Search group
- Add or update group
- Set group permissions
- Group members will be pushed to LDAP immediately
- Delete a group

Possible Uses of People DB

- Use LDAP for authorization
- Create & Manage global GIDs in People Search
- Keep your people data in sync with master metadata
- Refactor your People related scripts to use People REST API or LDAP as your trusted data source
- Add your external users to PDB collaborators
- Integrate your site/service user registration with PDB
- Automatic UNIX user and group creation using PADL nss_ldap plugin