

Python Developer Technical Assessment

Active Directory Integration Web Application

Active Directory مع متكامل ويب تطبيق - Python مطور تقييم مشروع

Parameter	Value
Duration / المدة	5 Working Days / عمل أيام 5
Technologies	Python, Flask/Django, SQL Server, Active Directory (LDAP)
Difficulty / الصعوبة	Intermediate to Advanced / متقدم إلى متوسط

1. Project Overview / المشروع على عامة نظرة

Build a web application that integrates with Windows Server Active Directory to manage employee data. The system should allow employees to authenticate using their domain credentials and view their information from both the database and Active Directory.

يسمح أن يجب. الموظفين بيانات لإدارة Windows Server على Active Directory مع متكامل ويب تطبيق بناء Active و البيانات قاعدة من معلوماتهم وعرض بهم الخاصة الدومين بيانات باستخدام الدخول بتسجيل للموظفين النظام Directory.

2. Environment Setup / العمل بيئة إعداد

2.1 Domain Information / الدومين معلومات

Parameter	Value
Domain Name	eissa.local
Domain Controller IP	[Will be provided / توفيره سيتم]
LDAP Port	389 (LDAP) / 636 (LDAPS)
Base DN	DC=eissa,DC=local

2.2 Organizational Units (OUs) Structure / التنظيمية الوحدات هيكل

The following OUs are available in the domain under the "New" container:

- Accountant (المحاسبة)
- Administrative Affairs (الإدارية الشؤون)
- Camera (الكاميرات)
- Exhibit (المعارض)
- HR (البشرية الموارد)

- IT (المعلومات تكنولوجيا)
- Audit (المراجعة)
- Out Work (العمل الخارجي)
- Projects (المشاريع)
- Sales (المبيعات)
- Supplies (المشتريات)
- Secretarial (السكرتارية)

3. Technical Requirements / التقنية المتطلبات

Phase 1: Core Application (Required)

(مطلوب) الأساسي التطبيق: الأولى المرحلة

3.1.1 Database Design / البيانات قاعدة تصميم

Create a SQL Server database with the following requirements:

- Employee table storing: Employee ID, Full Name (Arabic & English), Job Title, Department, Hire Date, National ID
- Do NOT store: Password, Email, Phone Number (these come from AD)
- Link employees to AD using sAMAccountName or userPrincipalName
- Proper indexing and relationships

3.1.2 Web Application Features / التطبيق مميزات

1. Admin Panel / الإدارة لوحة:

- Add new employees (basic info only, no credentials)
- View all employees list
- Edit employee information
- Sync with Active Directory

2. Employee Authentication / الموظفين مصادقة:

- Login using AD credentials (username & password)
- Validate against Domain Controller using LDAP
- Session management

3. Employee Dashboard / الموظف لوحة:

- Display employee data from database
- Display AD information (Email, Phone, OU/Department)
- Show which Organizational Unit (OU) the employee belongs to

Phase 2: OU Management (Bonus)

(إضافي) التنظيمية الوحدات إدارة: الثانية المرحلة

Implement administrative functionality to manage employee OU assignments:

- Admin can view employee's current OU
- Admin can transfer employee from one OU to another
- Changes must reflect on the Domain Controller
- Maintain audit log of OU transfers

Phase 3: External API (Advanced)

(متقدم) خارجي API: المرحلة الثالثة

Create REST API endpoints for mobile application integration:

- POST /api/auth/login - Authenticate using AD credentials
- GET /api/employee/profile - Get employee profile data
- JWT token-based authentication
- Secure endpoints with proper authorization
- API documentation (Swagger/OpenAPI)

4. Technical Specifications / التقنية المواصفات

4.1 Required Stack / المطلوبة التقنيات

Component	Technology	Notes
Backend	Python (Flask or Django)	Your choice
Database	SQL Server	Required
AD Integration	ldap3 / python-ldap	LDAP protocol
Frontend	HTML/CSS/JS or React	Your choice
API (Phase 3)	REST API + JWT	For mobile app

4.2 Sample AD User Data / نموذجية مستخدم بيانات

Based on the provided screenshots, here is sample user information:

Attribute	Value
Display Name	mohamed khaled
First Name	mohamed
Last Name	khaled
Email	mohamed.khaled@eissa.local
Telephone	110030
Current OU	OU=projects,OU=New,DC=eissa,DC=local

5. Code Hints / الكود إرشادات

5.1 LDAP Connection Example

```
from ldap3 import Server, Connection, ALL, SUBTREE

server = Server('eissa.local', port=389, get_info=ALL)
conn = Connection(server, user='EISSA\\username', password='password')
conn.bind()
```

5.2 LDAP Search Example

```
conn.search(
    search_base='DC=eissa,DC=local',
    search_filter='(sAMAccountName=mohamed.khaled)',
    search_scope=SUBTREE,
    attributes=['cn', 'mail', 'telephoneNumber', 'distinguishedName']
)
```

5.3 Move User to Another OU (Phase 2)

```
# Move user from one OU to another
old_dn = 'CN=mohamed khaled,OU=projects,OU=New,DC=eissa,DC=local'
new_ou = 'OU=IT,OU=New,DC=eissa,DC=local'

conn.modify_dn(old_dn, 'CN=mohamed khaled', new_superior=new_ou)
```

6. Deliverables / المطلوبة المخرجات

1. **Source Code** - Complete project with clear folder structure
2. **Database Script** - SQL script to create tables and initial data
3. **README.md** - Installation and setup instructions
4. **requirements.txt** - Python dependencies
5. **Demo Video (Optional)** - Short video showing the application
6. **API Documentation (Phase 3)** - Swagger/Postman collection

7. Evaluation Criteria / التقييم معايير

Criteria / المعيار	Weight	Description
Code Quality / الكود جودة	25%	Clean, readable, well-organized code
Functionality / الوظائف	30%	All required features working correctly
AD Integration / تكامل AD	20%	Proper LDAP implementation
Security / الأمان	15%	Password handling, SQL injection prevention
Documentation / التوثيق	10%	Clear README, code comments

7.1 Bonus Points / إضافية نقاط

- Phase 2 completion: +15 points
- Phase 3 completion: +20 points
- Docker containerization: +5 points
- Unit tests: +5 points
- CI/CD pipeline: +5 points

8. Important Notes / هامة ملاحظات

- **Do not hardcode credentials** - Use environment variables or config files
- **Error handling is required** - Handle connection failures gracefully
- **Test your code** - Ensure it works with the provided domain
- **Ask questions** - If anything is unclear, don't hesitate to ask
- **Focus on Phase 1 first** - Complete it before moving to bonus phases

Contact Information / التواصل معلومات

For any questions or clarifications regarding this assessment, please contact:

- **Email:** [Your Email Here]
- **Phone:** [Your Phone Here]

Good Luck! / بالتوفيق!