Demo 6 – Service Endpoints

Requirements:

- F&O subscription
- (optional) Postman

Endpoints in Dynamics 365 Finance / Supply Chain

Service endpoint	Endpoint: https://[baseURI]/data
SOAP-based custom service	Endpoint: http://[baseURI]/Metadata
JSON-based custom service	Endpoint: https://[baseURI]/soap/services/service_group_name
OData Service	Endpoint: https://[baseURI]/api/services/service_group_name
REST Metadata Service	Endpoint: https://[baseURI]/data

OData services, JSON-based custom services, and the REST metadata service support standard OAuth 2.0 authentication.

Register App in AAD

1. In the Azure Portal for the subscription you are using for your F&O tenant, go to Azure Active Directory > Properties > Directory ID. Write this ID down.
2. Go to App Registrations > New application registration, fill out fields like this:

   Name = MyFnOApp

   Web app or API

   URL: leave empty
3. Write down the application ID
4. Under required permissions, select:
   - Microsoft Dynamics ERP (Microsoft.ERP)

   Delegated permissions:
   - Access Dynamics AX Custom Service
   - Access Dynamics AX data
   - Access Dynamics AX online as organization users
5. Select Done.
6. Go to Keys > enter a description, select Never Expires and Save. Write down the key.

Register App in Dynamics

7. In F&O go to System Administration > Set Up > AAD applications > New, fill in the fields like this:

   Client ID: the Application ID from step 3

   Name: FnOApp

   User ID: Admin user

   Save.

Explore the F&O endpoints

REST Metadata Service

Read-only service, provides metadata information for elements.
Endpoint: http://[baseURI]/Metadata

Open the browser and explore:
https://[baseURI]/metadata


```
{
  "@odata.context":"https://fnointerfaceenvdemo400714ee58ed3767aos.cloudax.dynamics.com/metadata/$metadata","value":[
    {
      "name":"Labels","kind":"EntitySet","url":"Labels"
    },{
      "name":"DataEntities","kind":"EntitySet","url":"DataEntities"
    },{
      "name":"PublicEntities","kind":"EntitySet","url":"PublicEntities"
    },{
      "name":"PublicEnumerations","kind":"EntitySet","url":"PublicEnumerations"
    }
  ]
}
```


https://[baseURI]/metadata/DataEntities


```
{
  "@odata.context":"https://fnointerfaceenvdemo400714ee58ed3767aos.cloudax.dynamics.com/metadata/$metadata#DataEntities","value":[
    {
      "Name":"WorkflowWorkItemQueueAssigneeEntity","PublicEntityName":"","PublicCollectionName":"","LabelId":"@SYS152326","DataServiceEnabled":false,"DataManagementEnabled":true,"EntityCategory":"Parameters","IsReadOnly":false
    },{
      "Name":"DataManagementTemplateDetailEntity","PublicEntityName":"DataManagementTemplateDetail","PublicCollectionName":"DataManagementTemplateDetails","LabelId":"@DMF202","DataServiceEnabled":true,"DataManagementEnabled":tr
    },{
      "Name":"DataManagementTargetMapEntity","PublicEntityName":"DataManagementTargetMapEntity","PublicCollectionName":"DataManagementTargetMapEntities","LabelId":"@DMF210","DataServiceEnabled":true,"DataManagementEnabled":fals
    },{
      "Name":"BusinessEventsCatalog","PublicEntityName":"BusinessEventsCatalog","PublicCollectionName":"BusinessEventsCatalogs","LabelId":"@BusinessEvents:BusinessEventsTable","DataServiceEnabled":true,"DataManagementEnabled":fa
```


https://[baseURI]/metadata/PublicEntities


```
{
  "@odata.context":"https://fnointerfaceenvdemo400714ee58ed3767aos.cloudax.dynamics.com/metadata/$metadata#PublicEntities","value":[
    {
      "Name":"AssetMaintenanceRequestLifecycleState","EntitySetName":"AssetMaintenanceRequestLifecycleStates","LabelId":"@EnterpriseAssetManagementAppSuite:EntAssetParmStgRequestEntity","IsReadOnly":false,"ConfigurationEnabled":true,"Properties":[
        {

"Name":"dataAreaId","TypeName":"Edm.String","DataType":"String","LabelId":"@SYS13342","IsKey":true,"IsMandatory":false,"ConfigurationEnabled":true,"AllowEdit":true,"AllowEditOnCreate":true,"IsDimension":false,"DimensionRelation":null,"IsDynamicDimension":false,"DimensionLegalEntityProp
erty":null,"DimensionTypeProperty":null
        },{

"Name":"RequestLifecycleStateId","TypeName":"Edm.String","DataType":"String","LabelId":"@EnterpriseAssetManagementAppSuite:EntAsset282","IsKey":true,"IsMandatory":true,"ConfigurationEnabled":true,"AllowEdit":false,"AllowEditOnCreate":true,"IsDimension":false,"DimensionRelation":null,"I
sDynamicDimension":false,"DimensionLegalEntityProperty":null,"DimensionTypeProperty":null
```

OData service

REST endpoint, for CRUD operations. To expose data entities on OData endpoint, we need to mark the IsPublic property of data entity as true in the Application Object Tree (AOT).

Endpoint: https://[baseURI]/data

Explore customers:

https://[baseURI]/data/Customers

{
"@odata.context":"https://fnointerfaceenvdemo400714ee58ed3767aos.cloudax.dynamics.com/data/$metadata#Customers","value":[
{
"@odata.etag":"W/\"JzAsMjI1NjU0MjE1NTg7MCwwOzAsNTY1NzE0NTMyODswLDU2MzcxNDQ1NzY7MCwyMjU2NTQyNTY5MzswLDIyNTY1NDI3MjM2OzAsMDswLDIyNTY1NDI3MjM2OzAsMjI1NjU0MjcyMzY7MCwwJw==\"","dataAreaId":"usmf","CustomerAccount":"DE-
001","AddressBrazilianCNPJOrCPF":"","PartyType":"Organization","PrimaryContactFaxExtension":"","IsFuelSurchargeApplied":"No","SalesTaxGroup":"EXMPT
FOR","AddressCountryRegionId":"DEU","ContactPersonId":"","CustomerPaymentFineCode":"","BirthCountyCode":"","InvoiceAddress":"InvoiceAccount","PackingMaterialFeeLicenseNumber":"","TransactionPresenceType":"DoesNotApply","PrimaryContactTwitter":"","PrimaryContactEmailIsIM":"No","InvoiceA
ddressCity":"Berlin","IsFinalUser":"No","PrimaryContactEmail":"contoso.europe@vendor8.consolidatedmessenger.com","DeliveryAddressCounty":"","HasSuframaDiscountPISandCOFINS":"No","InvoiceAddressStreet":"Bahnhofstrasse 5","CURPNumber":"","Name":"Contoso
Europe","PrimaryContactLinkedInDescription":"","DeliveryAddressCountryRegionId":"DEU","ItemCustomerGroupId":"","PersonProfessionalTitle":"","SalesSegmentId":"10","IsServiceDeliveryAddressBased":"No","PrimaryContactTelexDescription":"Contoso Europe
Telex","InvoiceAddressDistrictName":"","InvoiceAddressTimeZone":null,"SalesAccountNumber":"","PrimaryContactPhoneIsMobile":"No","PrimaryContactFacebookDescription":"","TCSGroup":"","DeliveryAddressLocationId":"000001199","AddressZipCode":"10115","GiroTypeProjInvoice":"None","LineOfBusi
nessId":"2100","OrganizationPhoneticName":"","DeliveryAddressCountryRegionISOCode":"DE","CreditCardCVC":"None","DeliveryAddressValidFrom":"2016-08-
11T18:30:40Z","GiroTypeAccountStatement":"None","CalculateWithholdingTax":"No","IsRFIDPalletTaggingEnabled":"No","ElectronicInvoiceEAN":"","DeliveryFreightZone":"","PrimaryContactFax":"","TaxExemptNumber":"998765","DeliveryAddressDescription":"Contoso
Europe","DeliveryAddressLongitude":0,"BirthPlace":"","AddressCity":"Berlin","PersonInitials":"","CentralBankPurposeCode":"","FullPrimaryAddress":"Bahnhofstrasse 5\n10115
Berlin\nDeu","GiroTypeCollectionLetter":"None","OrderEntryDeadline":"","ForeignerId":"","WarehouseIsASNGenerated":"No","AddressLongitude":0,"PrimaryContactLinkedIn":"","PrimaryContactURL":"","IsFreightAccrued":"No","PartyState":"","PartyNumber":"000000838","InvoiceAccount":"","Warehous
eFulfillmentRate":0,"CentralBankPurposeNotes":"","CollectionsContactPersonId":"","PersonMaritalStatus":"None","AddressLocationId":"000001199","PaymentSchedule":"","PrimaryContactTwitterPurpose":"","GiroType":"None","InvoiceAddressDescription":"Contoso
Europe","AddressDistrictName":"","DeliveryTerms":"FOB","NumberSequenceGroup":"","PersonChildrenNames":"","PaymentMethod":"","DeliveryMode":"40","PersonProfessionalSuffix":"","OnHoldStatus":"No","WarehouseFulfillmentType":"None","AccountStatement":"Always","WarehouseId":"","DestinationC
ode":"","IRS1099CIndicator":"No","FrenchSiret":"","PaymentDay":"","BrazilianNIT":"","FederalIndicator":"None","EmployeeResponsibleNumber":"","PersonAnniversaryYear":0,"DefaultInventoryStatusId":"","PrimaryContactEmailDescription":"Contoso Europe
Email","AddressTimeZone":null,"PrimaryContactPhone":"01234 56789","InvoiceAddressCounty":"","DeliveryAddressCity":"Berlin","PANReferenceNumber":"","DeliveryAddressStreet":"Bahnhofstrasse
5","SalesCurrencyCode":"EUR","IsSalesTaxIncludedInPrices":"No","BrazilianCNPJOrCPF":"","PaymentFactoringAccount":"","PANNumber":"","PrimaryContactTwitterDescription":"","BrazilianCCM":"","ReceiptEmail":"","TDSGroup":"","MultiLineDiscountCode":"","PersonAnniversaryDay":0,"DefaultDimensi
onDisplayValue":"001-
-","SupplementaryItemGroupId":"","IsWithholdingTaxCalculated":"No","PaymentSpecification":"","AddressBooks":"","PrimaryContactEmailPurpose":"Business","SalesDistrict":"","ConsolidationDay":0,"IsExpressBillOfLadingAccepted":"No","CreditCardAddressVerification":"None","AddressState":"BE"
,"IsExcludedFromCollectionFeeCalculation":"No","CustomerPaymentFinancialInterestCode":"","IsTransactionPostedAsShipment":"No","IsExternallyMaintained":"No","CreditLimitIsMandatory":"No","PaymentTermsBaseDays":0,"FiscalCode":"","KnownAs":"","PrimaryContactTelex":"01234
56789","PaymentBankAccount":"","BrazilianIE":"","PreferentialCustomer":"No","ReceiptOption":"Retail3","FulfillmentErrorTolerance":"UseCompanyPolicy","AddressBrazilianIE":"","PersonAnniversaryMonth":"None","PrimaryContactPhoneExtension":"","PrimaryContactPhonePurpose":"Business","Expo
rtSale":"No","OrganizationNumber":"","CreditCardAddressVerificationIsAuthorizationVoidedOnFailure":"No","InvoiceAddressState":"BE","ReceiptCalendar":"Production","DeliveryAddressState":"BE","StateInscription":"","SalesReturnTaxGroup":"","PrimaryContactURLDescription":"","CustomerWithho
ldingContributionType":"Other","IsElectronicInvoice":"No","FederalAgencyLocationCode":"","GiroTypeFreeTextInvoice":"None","DeliveryAddressValidTo":"2154-12-
31T23:59:59Z","PersonPhoneticMiddleName":"","OrganizationABCCode":"None","BrazilianCNAE":"","WithholdingTaxGroupCode":"","NAFCode":"","AddressLatitude":0,"TotalDiscountCode":"","AddressLocationRoles":"Business;Delivery;Invoice;Other","PaymentCashDiscount":"","DeliveryAddressDistrictNam
e":"","CreditRating":"","PrimaryContactFacebook":"","InvoiceAddressLongitude":0,"LineDiscountCode":"","PartyCountry":"","InvoiceAddressLatitude":0,"IsIncomingFiscalDocumentGenerated":"No","IsInSuframaRegion":"No","SalesMemo":"","ReliefGroupId":"","IsExcludedFromInterestChargeCalculatio
n":"No","StatisticsGroupId":"01","SalesOrderPoolId":"","IsOrderNumberReferenceUsed":"No","AddressValidTo":"2154-12-31T23:59:59Z","FederalComments":"","PersonGender":"Unknown","PaymentTerms":"Net10","PrimaryContactPhoneDescription":"Contoso Europe
Phone","SalesSubsegmentId":"10","CustomerRebateGroupId":"","AddressCounty":"","IsRFIDCaseTaggingEnabled":"No","EnterpriseNumber":"","IsICMSContributor":"No","InvoiceAddressValidTo":"2154-12-31T23:59:59Z","DeliveryAddressTimeZone":null,"InvoiceAddressValidFrom":"2016-08-
11T18:30:40Z","CreditLimit":0,"CreditCardAddressVerificationLevel":"Accept","WarehouseIsEntireShipmentFilled":"No","PackingDutyLicense":"","NationalRegistryNumber":"","SiteId":"","InvoiceAddressCountryRegionISOCode":"DE","PrimaryContactURLPurpose":"","ChargesGroupId":"","PanStatus":"No
tAvailable","NameAlias":"Contoso
Europe","CommissionSalesGroupId":"","PrimaryContactFaxPurpose":"","PaymentIdType":"","AddressCountryRegionISOCode":"DE","VendorAccount":"","ResidenceForeignCountryRegionId":"","RFCNumber":"","PersonHobbies":"","ElectronicLocationId":"000001200","PrimaryContactLinkedInPurpose":"","Invoi
ceAddressZipCode":"10115","IsOneTimeCustomer":"No","ForeignCustomer":"No","CustomerTNAGroupId":"","AddressValidFrom":"2016-08-
11T18:30:40Z","CompanyType":"Blank","OrganizationNumberOfEmployees":0,"IsRFIDItemTaggingEnabled":"No","CustomerGroupId":"90","DeliveryAddressZipCode":"10115","GiroTypeInterestNote":"None","DeliveryReason":"","TaxRegistrationId":"","PaymentUseCashDiscount":"Normal","DiscountPriceGroupId
":"09","AddressDescription":"Contoso
Europe","SuframaNumber":"","IdentificationNumber":"","PersonPhoneticFirstName":"","PrimaryContactTelexPurpose":"Business","DeliveryAddressLatitude":0,"InvoiceAddressCountryRegionId":"DEU","PrimaryContactFacebookPurpose":"","CompanyChain":"","BrazilianINSSCEI":"","CommissionCustomerGrou

Top 3 customers:

https://[baseURI]/data/Customers?$top=3

Show only name and email address:

https://[baseURI]/data/Customers?$select=Name,PrimaryContactEmail

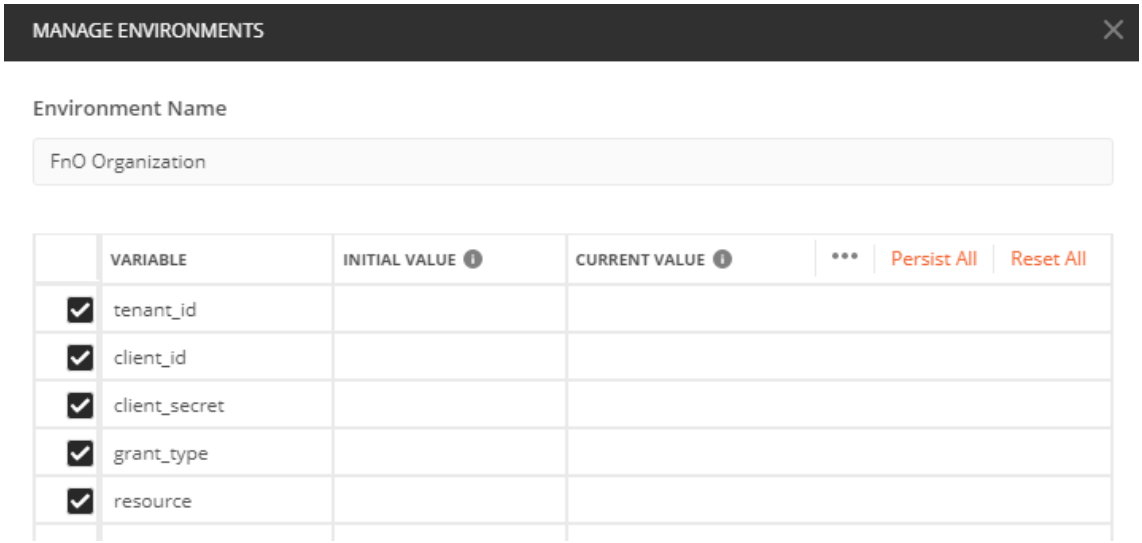
Format as json:

https://[baseURI]/data/Customers?$format=json

Test using Postman

You can use Postman (https://www.getpostman.com/postman) or a similar tool.

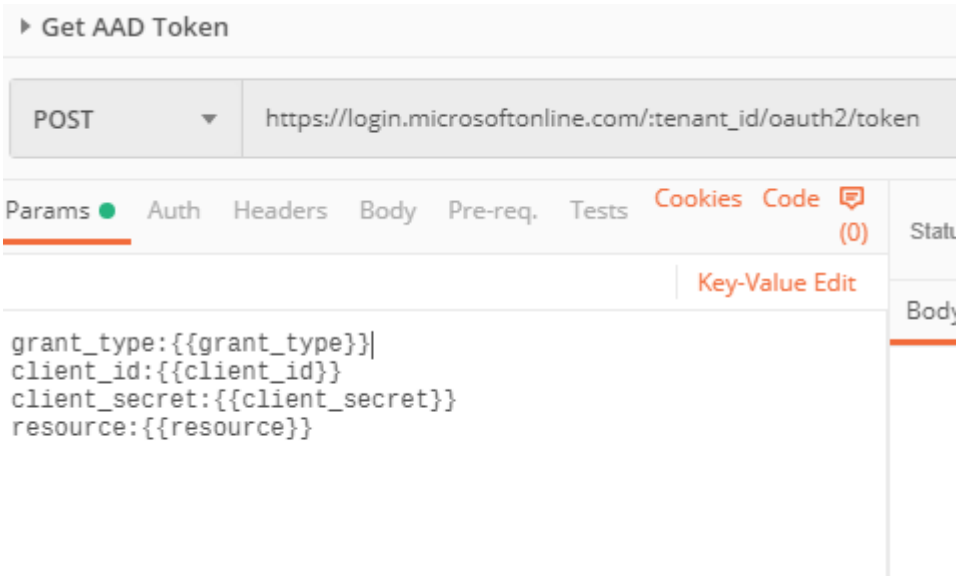
1. Click on the gear icon to open the list of environments, add a new one called "FnO Organization" adding the following keys and values:



Key	Value
tenant_id	The Azure tenant ID that you looked up in step 1
client_id	The Azure AD application ID from step 3
client_secret	The secret key that you generated during application registration during the setup of prerequisites
grant_type	client_credentials
resource	The base URL of the instance without the trailing '/'

2. New > Collection > call it "FnO Endpoint Tests".
3. Click on the collection > New Request > call it "Get AAD Token"
4. Select POST for the type of request and enter: https://login.microsoftonline.com/:tenant_id/oauth2/token
5. Within Body select form-data then click Bulk Edit and add:

   grant_type:{{grant_type}}
   client_id:{{client_id}}
   client_secret:{{client_secret}}
   resource:{{resource}}



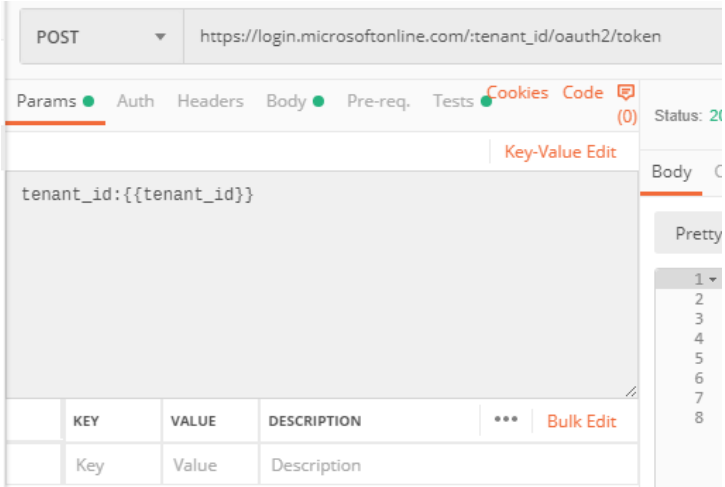
6. On the tests tab, create a test that validates that the response is reasonable, and that stores the returned authorization token in an environment variable:

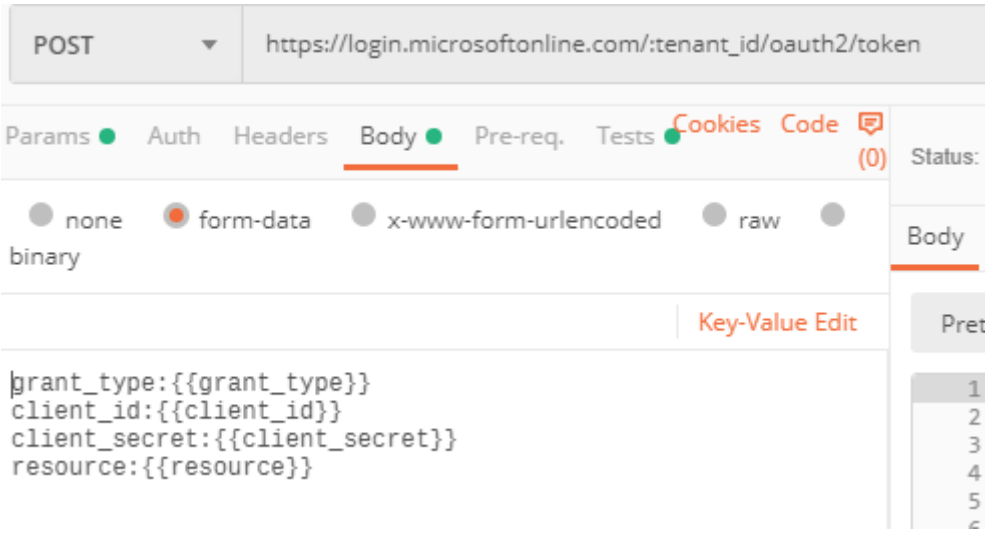
   var json = JSON.parse(responseBody);

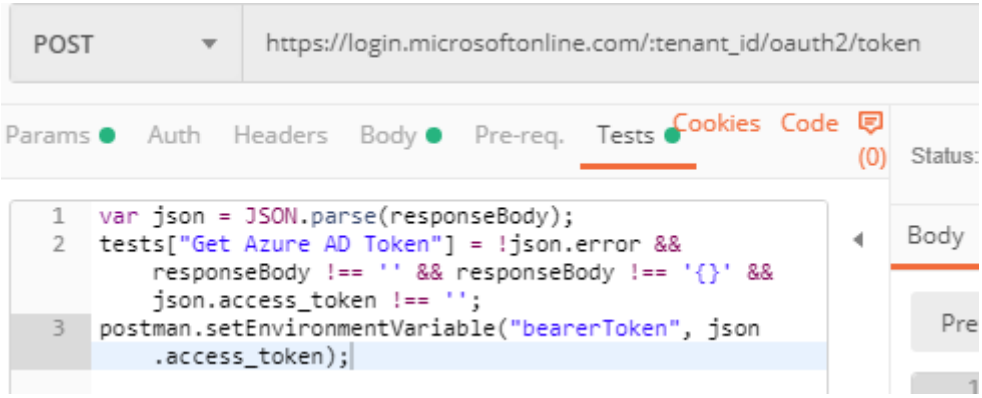
   tests["Get Azure AD Token"] = !json.error && responseBody !== '' && responseBody !== '{}' && json.access_token !== '';

   postman.setEnvironmentVariable("bearerToken", json.access_token);

7. You should have everything in place now like this:

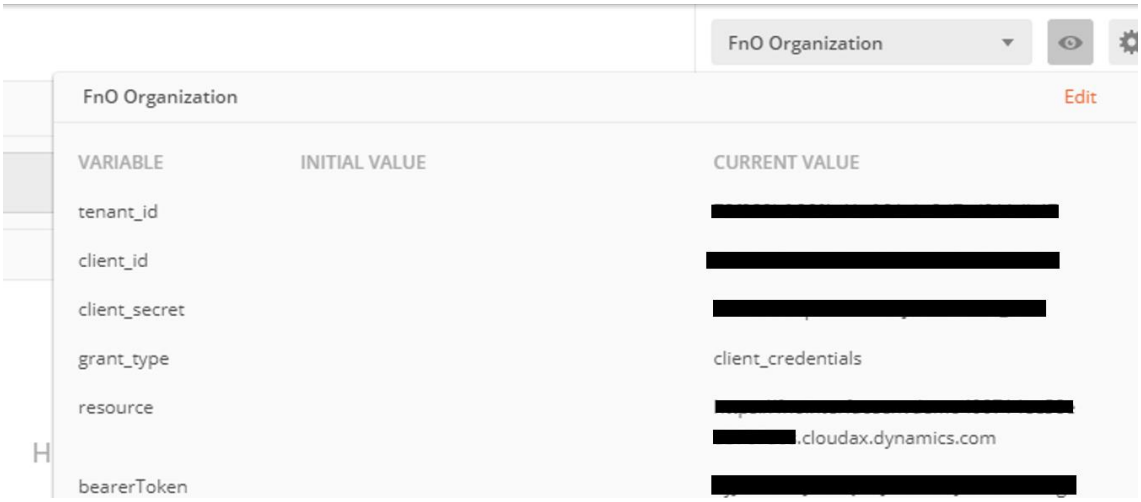






8. Click Save and then Send, you should receive a response with a token like so:

9. You can see that thanks to the test we added it has saved the token as an environment variable by clicking on the Environment Quick Lookup icon (the eye):



10. Right click on the collection and add a new request, call it "Read Customers".
11. Select GET and add https://[baseURI]/data/Customers?$select=Name,PrimaryContactEmail
12. Add a header for the token referencing the environment variable we saved in step 9:
13. Add a test:

    var json = JSON.parse(responseBody);

    tests["Get customer info"] = !json.error && responseBody !== '' && responseBody !== '{}';

14. Click Save and Send, you should receive a response with the list of customer's names and email addresses.