

Module Two

Examples “In the Wild”



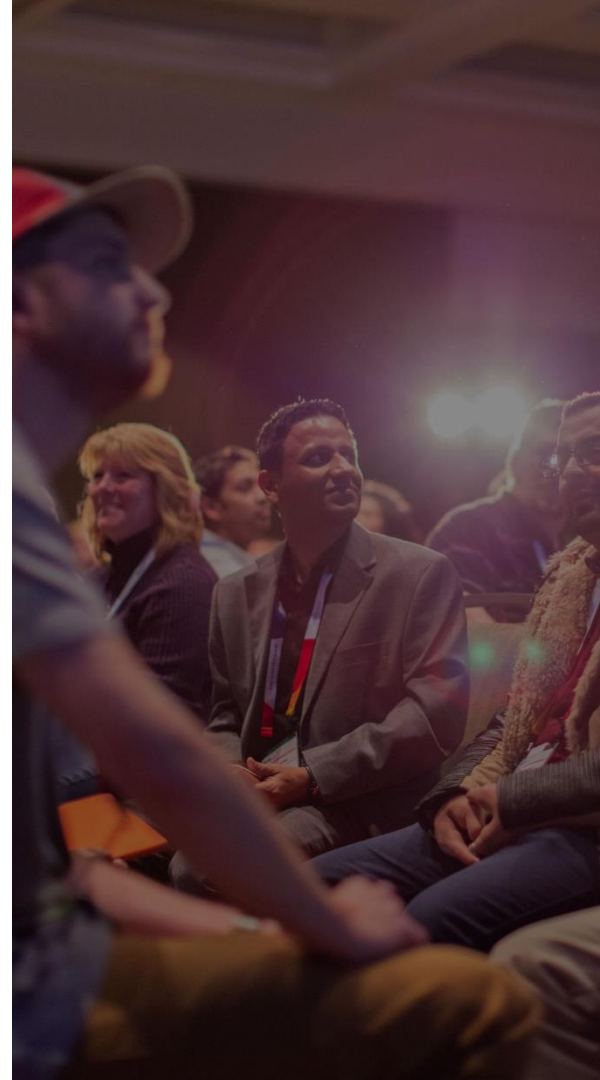
Tools of the Trade

"Please Mr. Postman"

- Explore APIs: PostMan
<https://chrome.google.com/webstore/detail/postman/fhbjgbiflinjbdgggehcdc/bncdddomop>
- Debug APIs: Fiddler
<http://www.telerik.com/fiddler>

Demo

Get Started with PostMan and
Fiddler



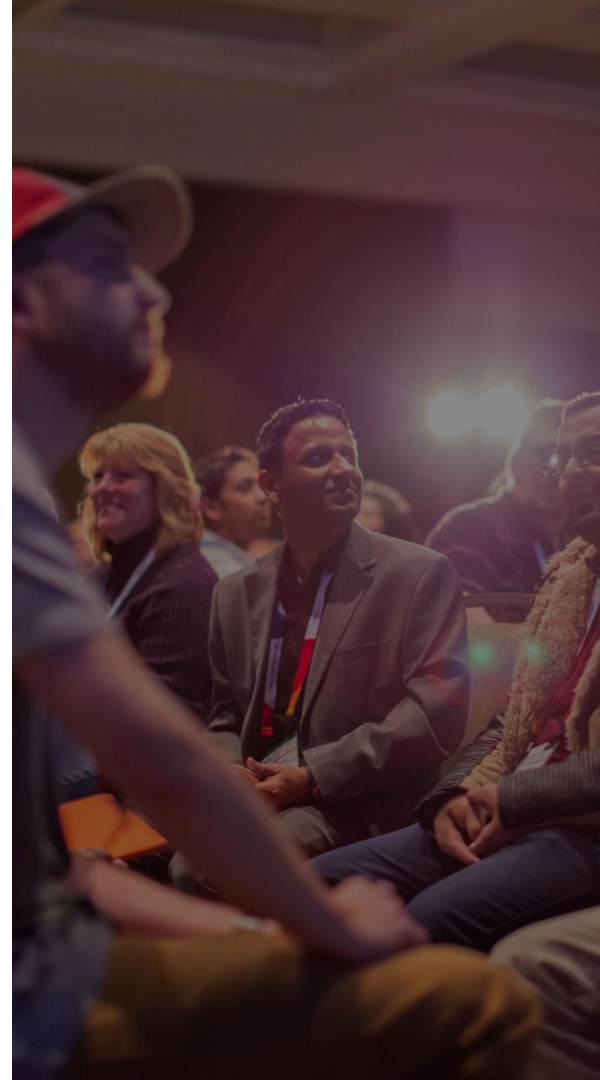
Social Media

Interface with "The Bird"

- Discovery: <https://dev.twitter.com/rest/public/search>
- Comprehension
- Usability (search example)
- Flexibility: <https://dev.twitter.com/overview/api/tweets> (deprecated items)
- Consistency
- Security: <https://dev.twitter.com/basics/security-best-practices>
- Integrity: <https://dev.twitter.com/overview/api/response-codes>

Demo

Interfacing with the Twitter API



Cloud Assets

Azure REST API

- Discovery: <http://bit.ly/azurerestapi>
- Comprehension
- Usability (CosmosDB example): <http://bit.ly/2wVK21Z>
- Flexibility
- Consistency
- Security
- Integrity: <http://bit.ly/2wbN01l>

Demo

Interfacing with the Azure API



API Simplified: Power of the SDK

Azure REST API

- Azure CLI: <http://bit.ly/azureclidocs>
- Azure SDKs: <http://bit.ly/azuresdks>
- .NET, Java, Node.js, PHP, Python, Ruby, Android, iOS, Swift, etc.
- All reach back to REST “behind the scenes”

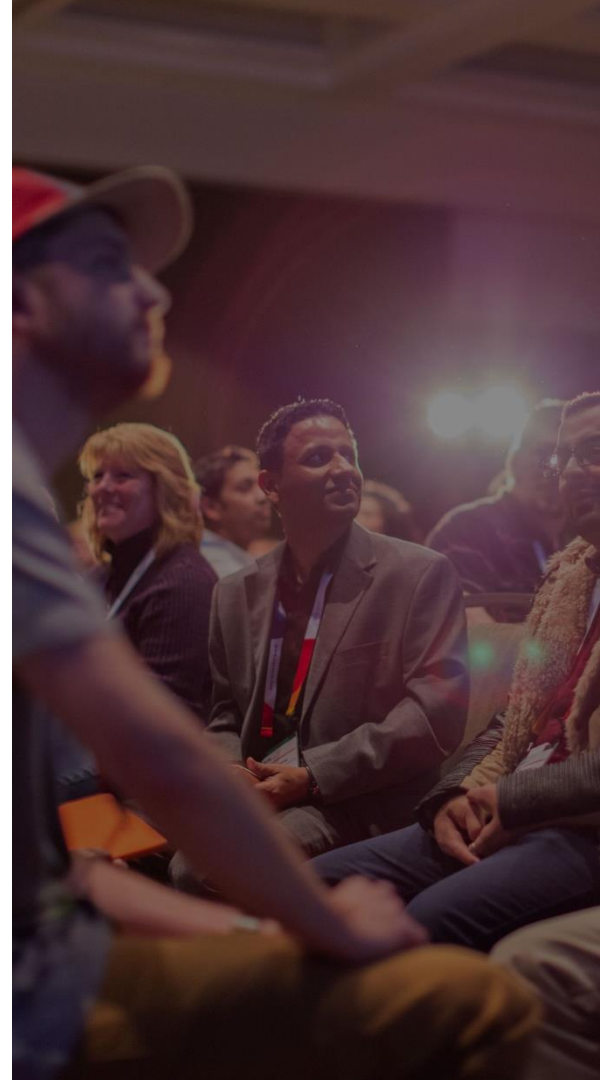
Demo

Using the Azure CLI

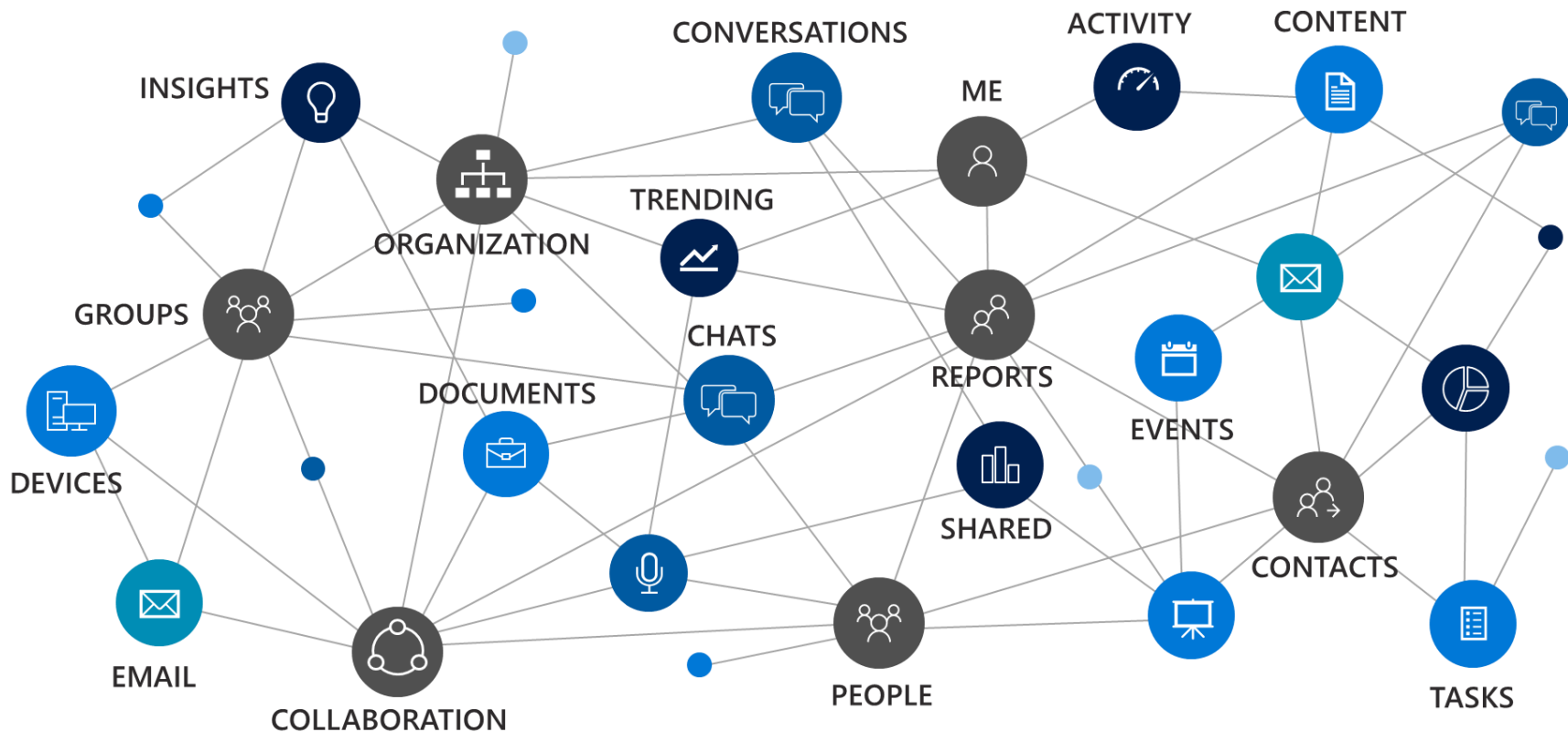


Case Study

Microsoft Graph API



Microsoft Graph



Office 365 Platform

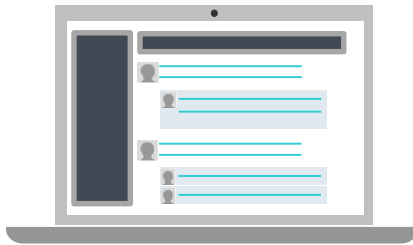
EXTENSIONS

Office
CANVASES

DOCUMENTS



CONVERSATIONS



PAGES

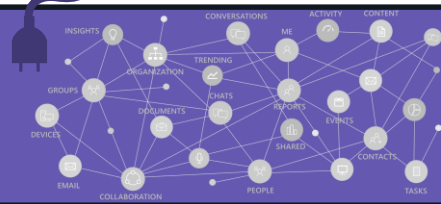
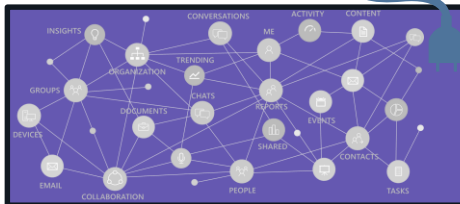


STANDALONE WEB AND DEVICE APPS

EMBEDDED CANVASES

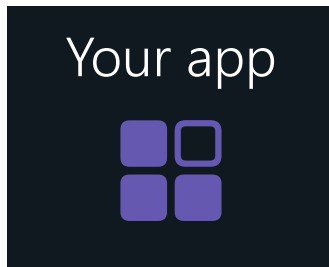


Microsoft Graph

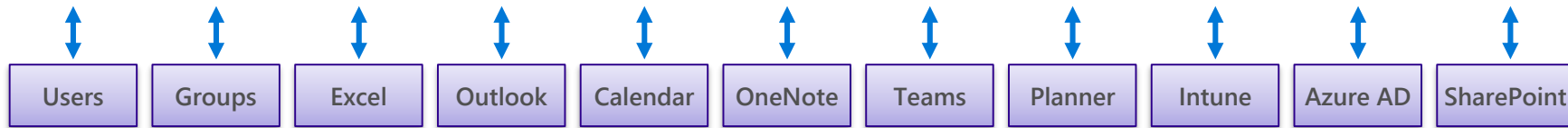


Data - User, group and organizational

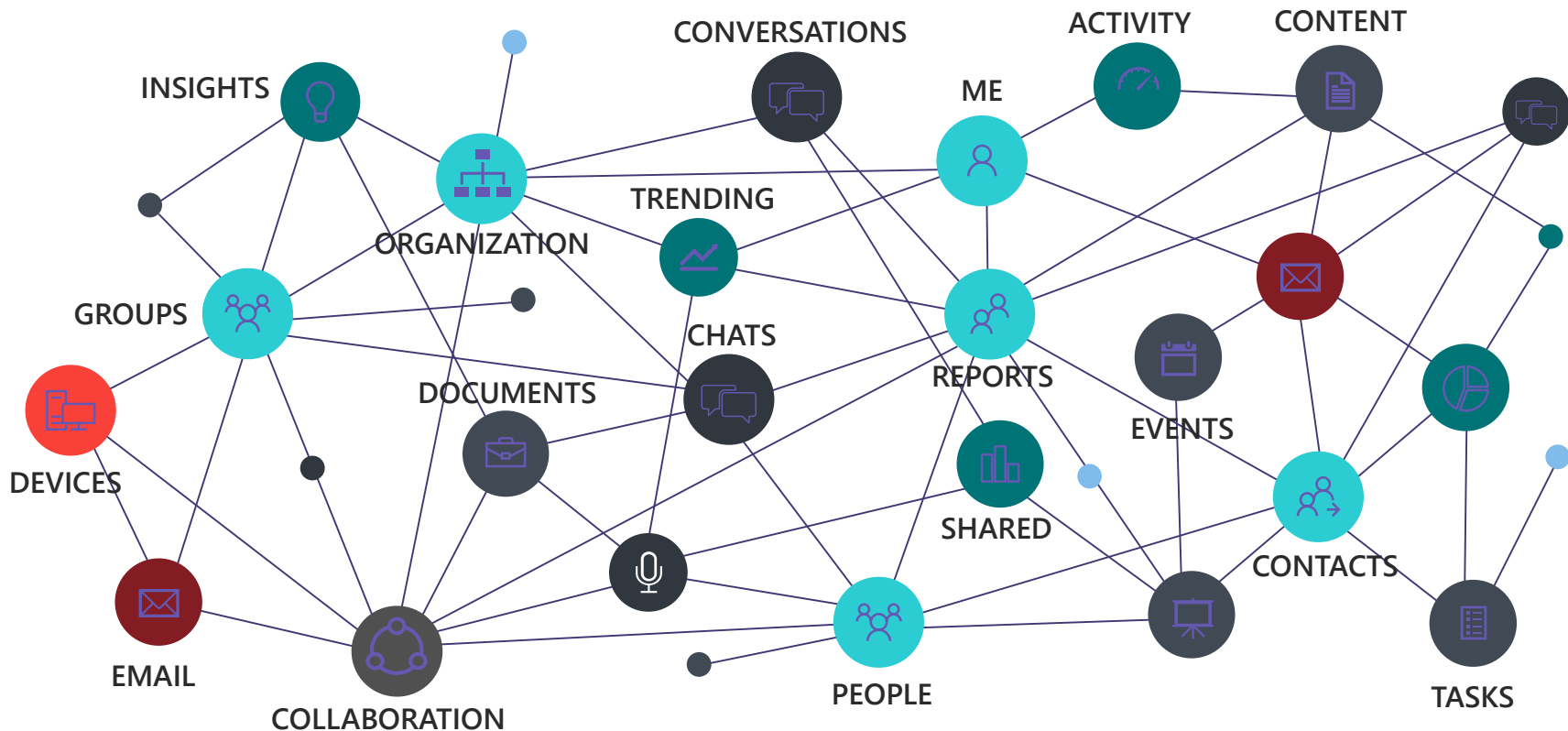
One endpoint
One token
All users



<https://graph.microsoft.com>

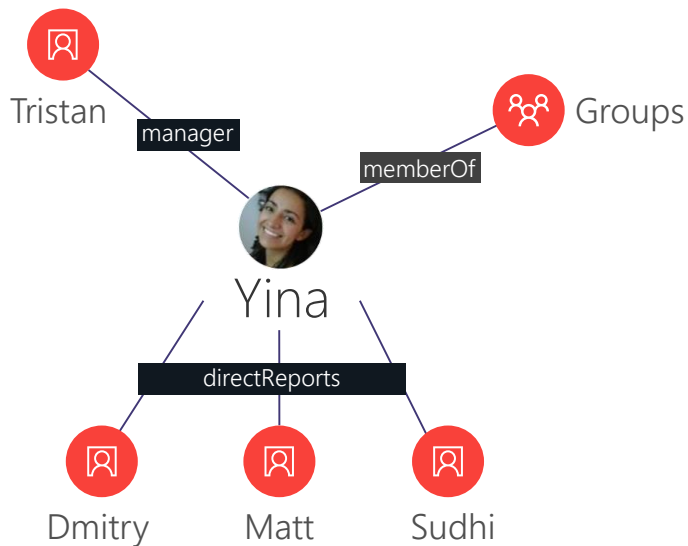


Microsoft Graph



With Microsoft Graph

Get the user **profile**



GET: [/users/yina](#)

```
{
  "displayName": "Yina",
  "jobTitle": "PRINCIPAL PM MANAGER",
}
```

GET: [/users/yina/photo/...](#)

```
{}
```

GET: [/users/yina/manager](#)

```
{"displayName": "Tristan", ...}
```

GET: [/users/yina/directReports](#)

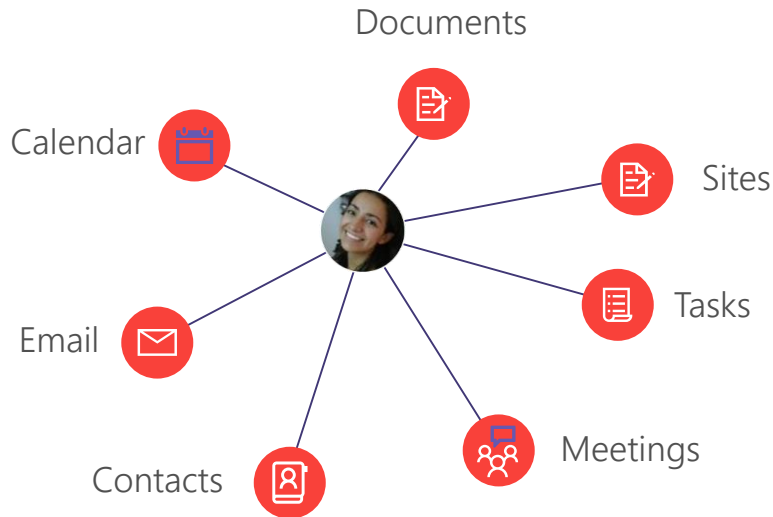
```
"value" : [
  {"displayName": "Matt", ...},
  {"displayName": "Dmitry", ...},
]
```

GET: [/me/memberOf/...](#)

```
"value" : [
  {"displayName": "Office engineering", ...},
  {"displayName": "Women in tech", ...},
]
```

With Microsoft Graph

Get **content** for email, calendar, files, tasks, sites, notes & more



```
GET /me/drive/root/...  
"value" : [  
  {"name": "proposal.pptx",... },  
  {"name": "forecast.xlsx",... }  
]
```

```
GET /drives/items/{id}/workbook
```

```
GET /me/messages
```

```
GET /me/events
```

```
GET /me/contacts
```

```
GET /me/onenote/notebooks
```

```
GET /me/planner/tasks
```

```
GET /me/devices
```

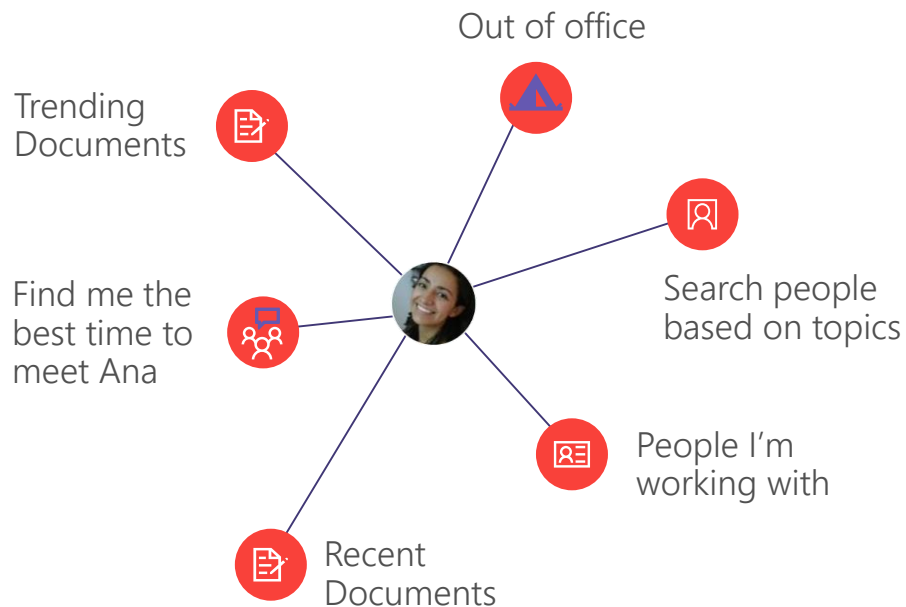
```
GET /sites:/teams/opg:/
```

```
GET /sites:/teams/opg:/lists
```

```
GET /groups/{id}/conversations
```


With Microsoft Graph

Get **insights** based on activities



```
GET /me/insights/trending
"value" : [
  {"name": "presentation.pptx", ...},
  {"name": "forecast.xlsx", ...}
]
```

```
GET /me/drive/recent
"value" : [
  {"name": "guidelines.pptx", ...},
  {"name": "budget.xlsx", ...}
]
```

```
GET people/?$search="topic: planning"
"value" : [
  {"displayName": "Dan", ...},
  {"displayName": "Sean", ...}
]
```

```
POST: /me/findMeetingTimes
{
  "attendees": [
    {
      "type": "required",
      "emailAddress": {
        "address": "ana@contoso.com"
      }
    }
  ],
  "meetingDuration": "2h"
}
```

Capabilities



Traversal of relationships

Query parameters

Batching - preview

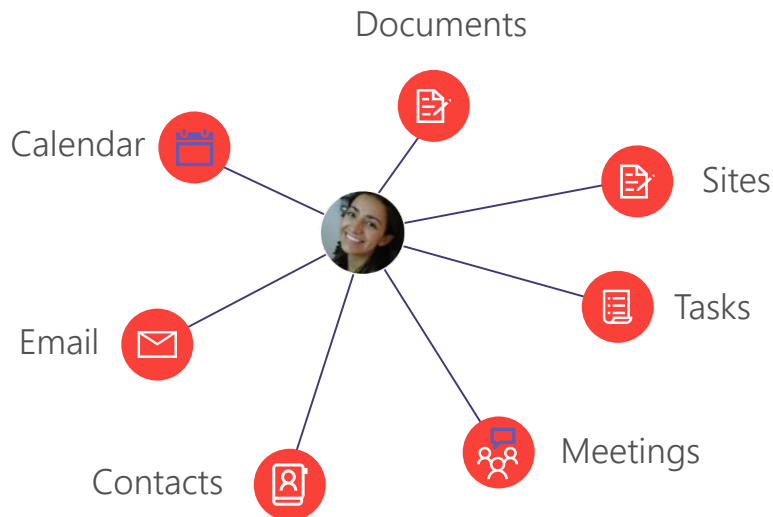
Notifications - users & groups preview

Track changes - GA

Extensions - GA

With Microsoft Graph

Use `$batch` to combine multiple requests in one call



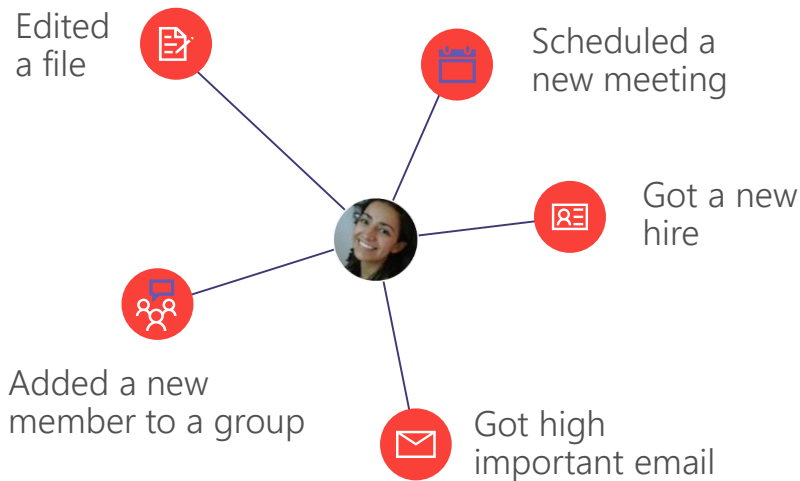
Batching

POST `/ $batch`

```
{
  "requests": [{
    "id": "1",
    "url": "/me/drive/root/children",
    "method": "POST",
    "body": {
      "name": "folder1",
      "folder": {}
    },
    "headers": {
      "content-type": "application/json"
    }
  }, {
    "id": "2",
    "url": "/me/drive/root/children/folder1",
    "method": "GET",
    "dependsOn": ["1"]
  }, {
    "id": "3",
    "method": "GET",
    "url": "/me/planner/tasks"
  }, {
    "id": "4",
    "method": "GET",
    "url": "/groups/{id}/events"
  }
  ]
}
```

With Microsoft Graph

Get notifications & track changes



```
GET /me/mailFolders/{id}/messages/delta
"@odata.deltalink": "me/mailfolders('AA')/messages/
delta?$deltatoken=BB",
"value" : [...]
```

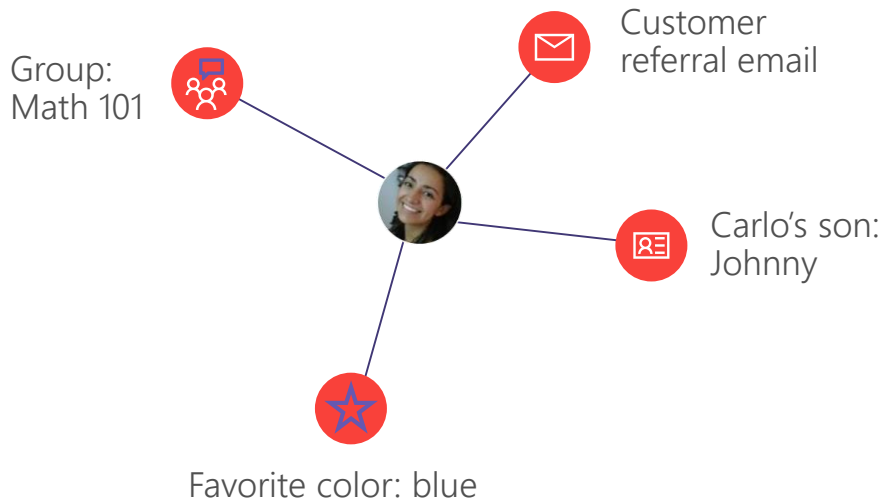
POST **/subscriptions**

```
{
  "changeType": "created,updated",
  "notificationUrl": "https://app.net/callback",
  "resource": "/me/mailfolders('AA')/messages",
}
```

```
GET /me/mailFolders/{id}/messages/delta
?$deltatoken=BB"
"value" : [...]
```

Extending Microsoft Graph

Add **extensions** to user, group, mail & more



Open Extensions

```
GET /me/message/<id>/?$expand=extensions
{
  "displayName": "Yina",
  "extensions": [
    {
      "extensionName": "Com.Contoso.Referral",
      "companyName": "Wingtip Toys",
      "expirationDate": "2017-12-30T11",
      "dealValue": 10,000
    }
  ]
}
```

Schema extensions

POST /**schemaExtensions**

```
{
  "id": "training_courses",
  "targetTypes": [ "Group" ],
  "properties": [
    {
      "name": "courseName",
      "type": "String"
    }
  ]
}
```

GET /groups?\$filter=courses/name eq Math101

What can be built with graph?



Intelligent Business Process



Smart
Meetings



Graph-Connected Devices



Smart Pickers



Graph-Powered Bots



Custom Dashboards

... and **MORE**



Why is graph so important?



Easy access to data
and intelligence
in Office365



Web Standards,
Open Platform



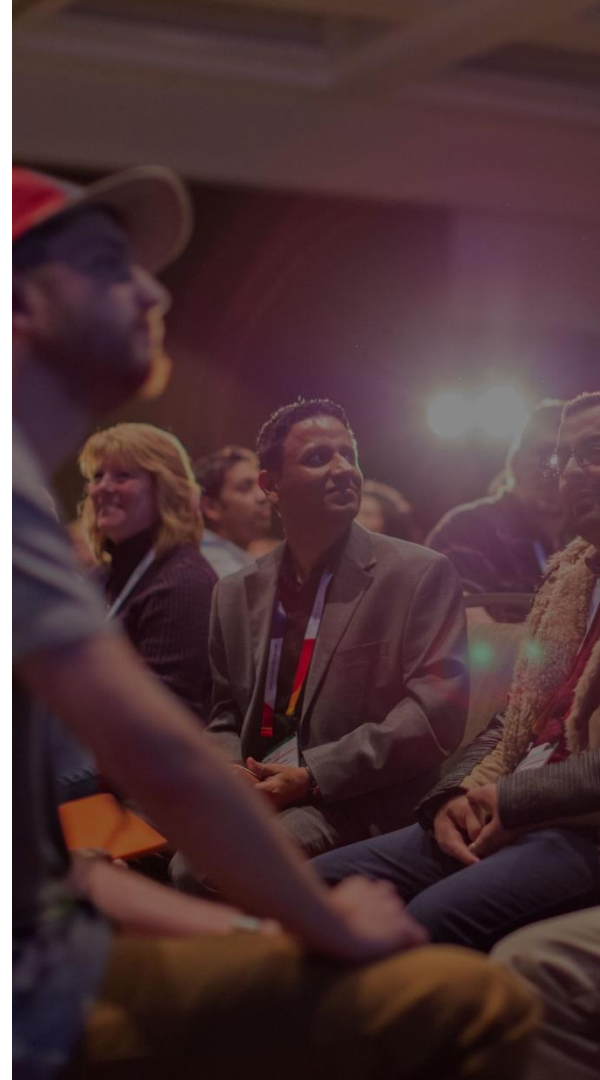
Secure
at the core

100M+

Active users



Quick Start



Calling the API

`https://graph.microsoft.com`

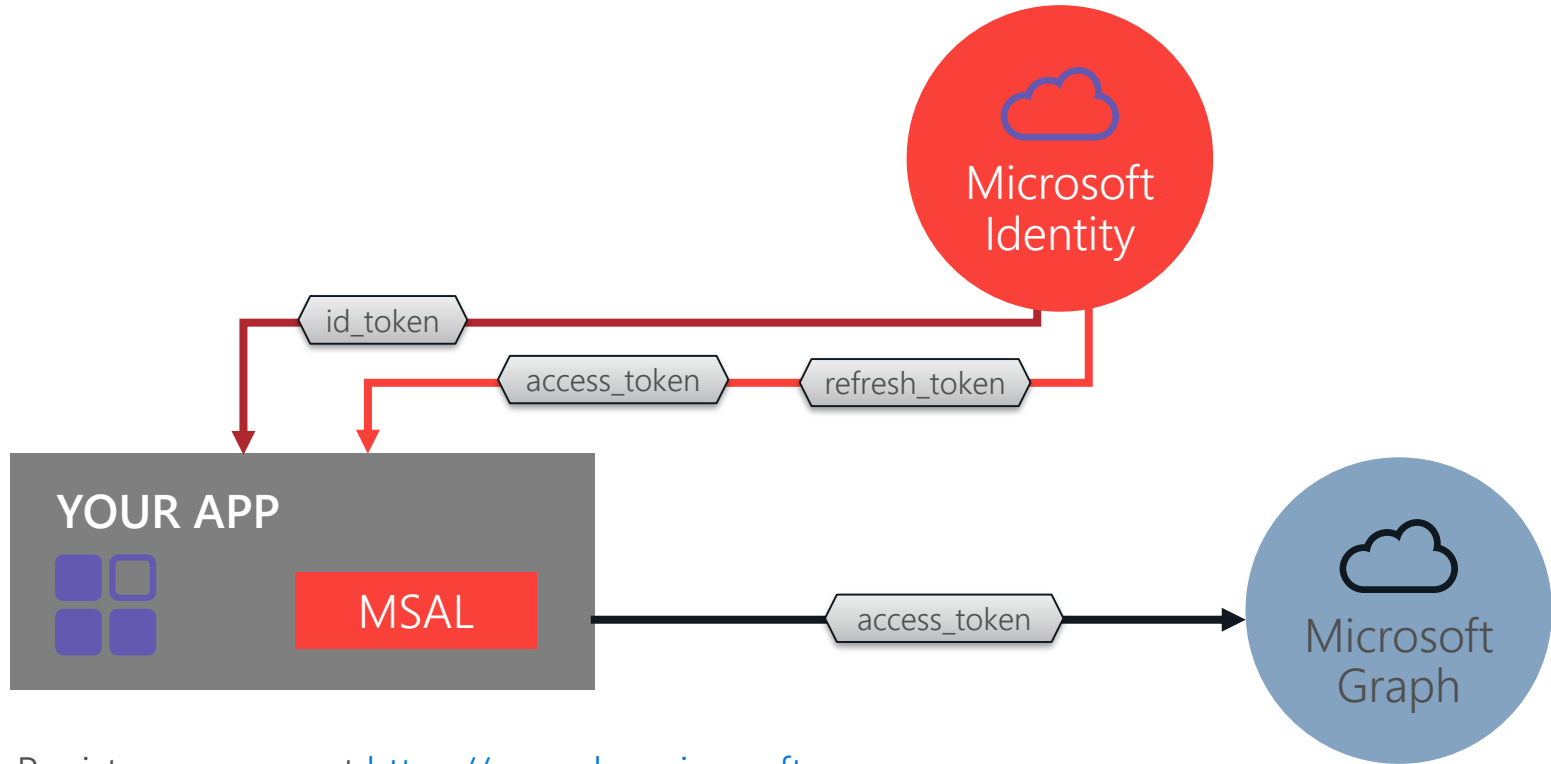
`/ {version} / {resource} / {id} / {property} ? {query-parameters}`

- HTTP verbs dictate the request intent: GET | POST | PATCH | PUT | DELETE
- Version: `/v1.0` or `/beta`
- Resource: `/users`, `/groups`, `/sites`, `/drives`, `/devices`, more...
- Member from collection: `/users/AAA`
- Property: `/users/AAA/department`
- Traverse to related resources via navigations: `/users/AAA/events`
- Query parameters: `/users/AAA/events?$top=5`
 - Format results: `$select` | `$orderby`
 - Control results: `$filter` | `$expand`
 - Paging: `$top` | `$skip` | `$skiptoken`

Common queries

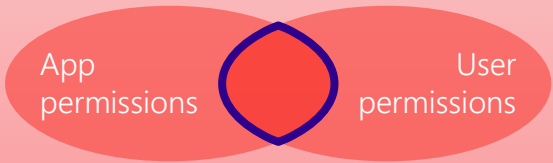
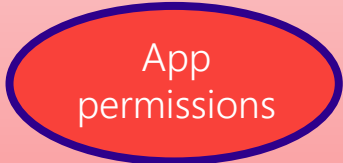
| Scenario | API - https://graph.microsoft.com/ |
|-------------------------------------|---|
| GET my profile | /v1.0/me |
| GET my files | /v1.0/me/drive/root/children |
| GET my photo | /v1.0/me/photo/\$value |
| GET my high importance email | /v1.0/me/messages?\$filter=importance eq 'high' |
| GET my calendar | /v1.0/me/calendar |
| GET my manager | /v1.0/me/manager |
| GET last user to modify foo.txt | /v1.0/me/drive/root/children/foo.txt/lastModifiedByUser |
| GET my recent files | /v1.0/me/drive/recent |
| GET Office 365 groups I'm member of | /v1.0/me/memberOf/\$/?\$filter=groupTypes/any(a:a eq 'unified') |
| GET users in my organization | /v1.0/users |
| GET group conversations | /v1.0/groups/<id>/conversations |
| GET people relevant to me | /beta/me/people |
| GET files trending around me | /beta/me/insights/trending |
| GET the root SharePoint site | /beta/sharepoint/sites/root |
| GET my Planner tasks | /beta/me/planner/tasks |
| GET my notes | /beta/me/onenote/notebooks |

Auth



Register your app at <https://apps.dev.microsoft.com>

Permissions

| | Get access on behalf of users | | Get access as a service |
|----------------------------|---|---|--|
| App type | Mobile, Web and Single page app | | Service and Daemon |
| Who can consent | Users can consent for their data | Admin can consent for them or for all users | Only admin can consent |
| Permissions of the request |  <p>A Venn diagram with two overlapping red ovals. The left oval is labeled 'App permissions' and the right oval is labeled 'User permissions'. The intersection of the two ovals is outlined with a thick blue border.</p> | |  <p>A single red oval labeled 'App permissions' with a thick blue border.</p> |

Demo

Graph Explorer





Thank You

Learn more from Jeremy Likness

[@JeremyLikness](#)

Jeremy.Likness@Microsoft.com