



# Building apps for Microsoft SharePoint and OneDrive

Integrate and extend with your application experience

# Agenda

Microsoft SharePoint and OneDrive  
overview and opportunity

## Extensibility scenarios

- Files
- Lists
- SharePoint Framework (SPFx) solutions
- Deployment and configuration
- Open source and Community



# Microsoft SharePoint Content Platform



# SharePoint



## Content Management Leader

Best-in-class collaboration, workflow, search, compliance, AI



## Anywhere Access

Files, sites, lists, videos - standalone apps, site, and Microsoft Teams across devices



## Powering Microsoft 365 Innovation

SharePoint, Teams, Office, OneDrive, Lists, Stream, Viva, Fluid



## Solutions Platform

SharePoint Framework, Graph API, Power Platform – including inside Microsoft Teams



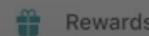
Relecloud

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## Dashboard

[See all](#)**Stage 2**

Mandatory WFH.  
Employee updates  
and resources

**Feb 15, 2021**

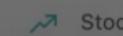
The next vesting  
date

**1 due today**

Complete daily  
before showing up  
to work

[Overview](#)**15 days**

Paid time off  
available

[Submit](#)**\$250.49**

Relecloud stock  
value, 10:30am,  
NASDAQ



Give your mind a  
break with  
**Headspace**

[Start meditating](#)

Leading remote  
projects and  
virtual teams

**3 days**

with booked focus  
time this week

[Plan focus time](#)**\$80.12**

Unsubmitted  
expense balance  
due by 25th

[Details](#)

Office plants  
watering schedule

[Browse](#)

Got a process  
idea? Engage and  
suggest!

[Submit](#)

10% up  
Compared to  
previous results

[Re-test](#)[...](#)**Patti Fernandez**

Aug 27, 2020, 12:30pm

 Posted in Culture Club

### Celebrating our employees with disabilities

'I have dyslexia': A chief engineer spoke up to help others with learning disabilities.

 Wired

Relecloud



Relecloud

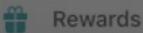
[Home](#)   [Who we are](#) ▾   [What's happening](#)

## Dashboard



### Stage 2

Mandatory WFH.  
Employee updates  
and resources

**Feb 15, 2021**

The next vesting  
date



## Viva

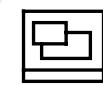
Learning

Leading remote  
projects and  
virtual teams



## Employee Experience Platform

Growing investment in employee  
wellbeing and development



## Microsoft Teams Apps

Viva Connections, Insights, Topics, Learning



## Built on Microsoft 365

Inside Teams and using SharePoint,  
Stream, Yammer, Power Platform



## Customization

Tailor and integrate 3rd-apps and custom  
solutions via Microsoft 365 platform

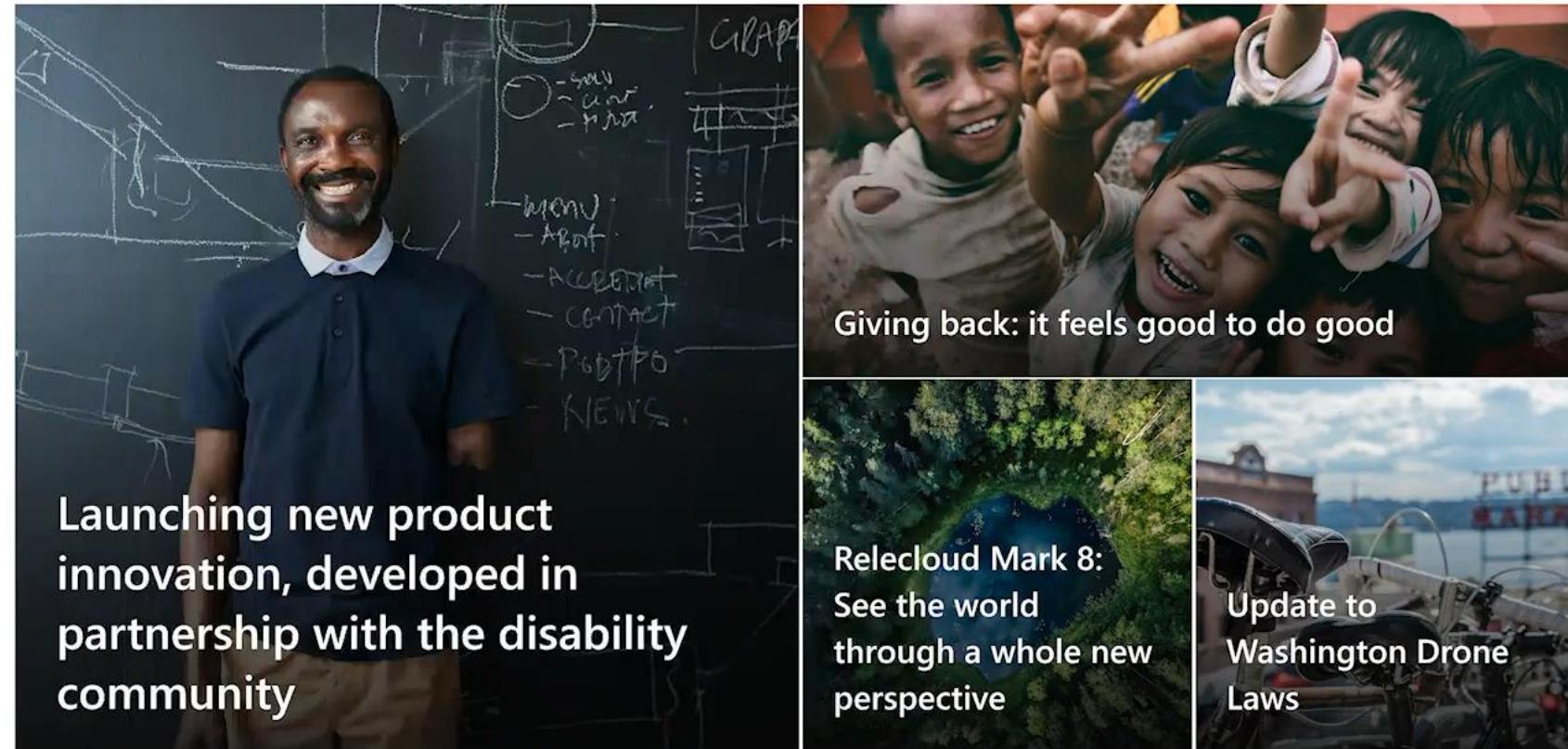


# RELECLOUD



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Confidential English ▾ ★ ⌂ ⌃ ⌂



## Company feed



## Local weather

Contoso HQ 🇺🇸



68 °F

Mostly cloudy  
75°/55°

MSN Weather

## Dashboard

COVID Check

Stage 2

Answer before  
showing up to  
work

[Submit](#)

...

Rewards

Jan 15, 2021

The next vesting  
date



Tasks

1 due today

Complete daily  
before showing  
up to work

[Overview](#)

Expenses 2.0

\$80.12

Unsubmitted  
expense balance  
due by 25th

[Details](#)

# Microsoft 365 Collaborative Applications



# Microsoft 365 Platform



## Next Gen Collaborative Apps

Enable users to stay in the flow of work and IT to have common governance



## Microsoft Teams

Apps, bots, tabs, meetings extensions, approvals



## Microsoft Graph

Secure access to data in Microsoft 365, connectors to add more for search and compliance



## Tools and Marketplace

X-platform web tech, VS code, Power Apps for LOB, SharePoint Framework for content

# Partners building with SharePoint and OneDrive



Powell 365



Crow Canyon  
Software



FlowForma®  
BPM for Microsoft Office 365®



CloudFASTPATH  
by Tervela



unity

Aderant

-!- Valo

DocuSign®

••• FireStart

harmon.ie®

AGILEPOINT

Sharegate

Wizdom

LightningTools

AvePoint®

akumina

CardioLog Analytics

Bentley®

Sharepointalist

SKY SYNC™  
Enterprise Content Integration

nintex

OnePlace Solutions

RecordPoint®

fotopia

LiveTiles

DOC AUTO®

Beezy

saketa

Gimmal

colligo

KnowledgeLake.

HELUX

bindtuning

# Files extensibility scenarios

An overview of the extensibility options when working with files  
in SharePoint and OneDrive

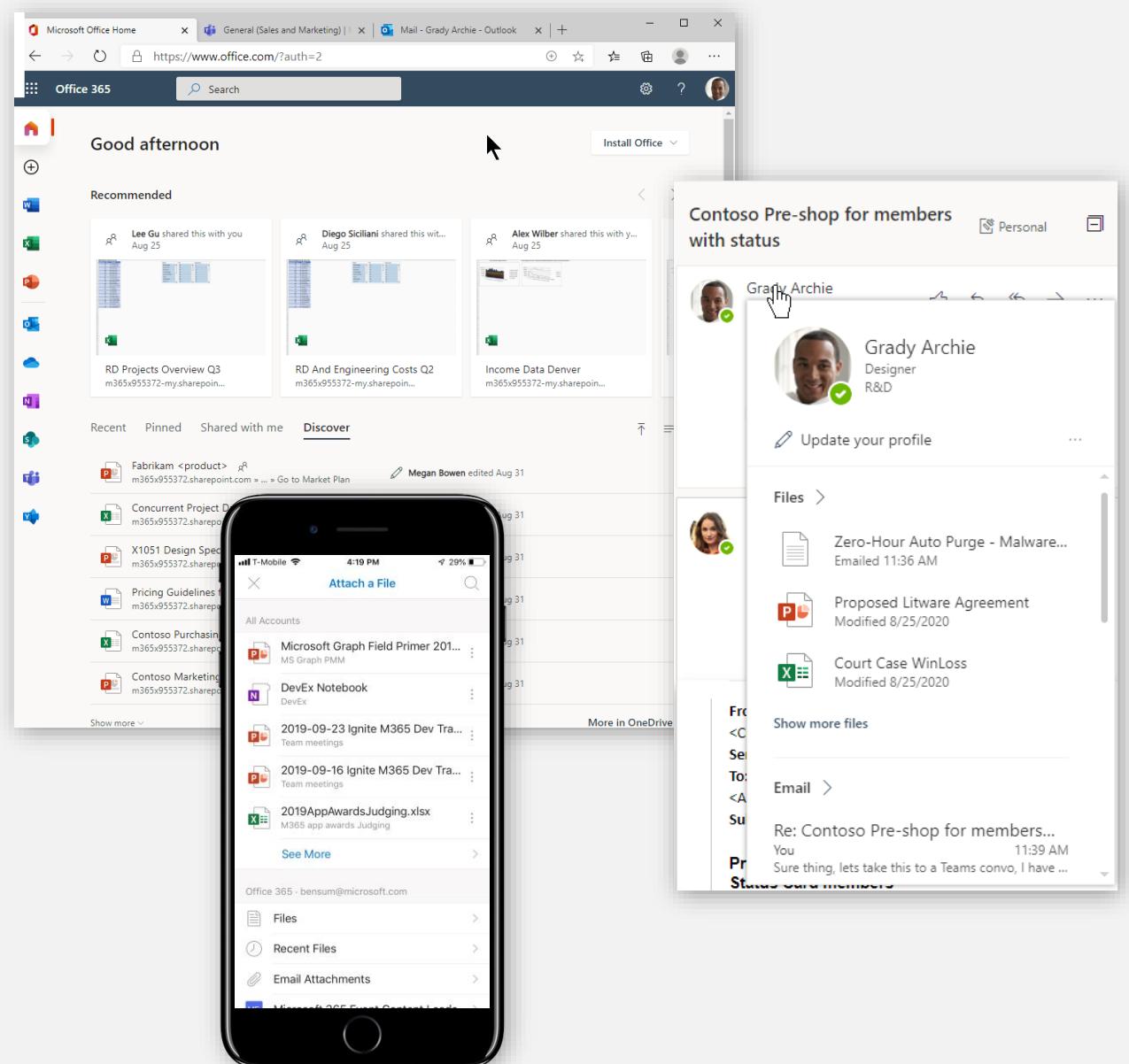


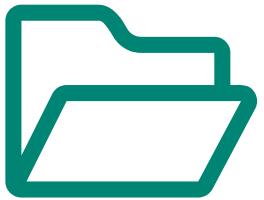
# 100 Petabytes

new data in SharePoint monthly

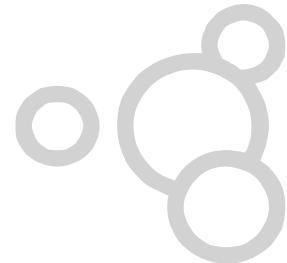
# Files

- File preview
- No additional infrastructure for hosting
- Maintain a focus on your app while we do the rest
- Government and industry compliant





Viewing, selecting  
and uploading files



Deep integration  
via API's



Owning my  
file types

# Selecting files

Control allowing file browsing and picking

File Open mode: allows for file downloads via direct download link, file id's (for API access) or read-only sharing link

## Implementation

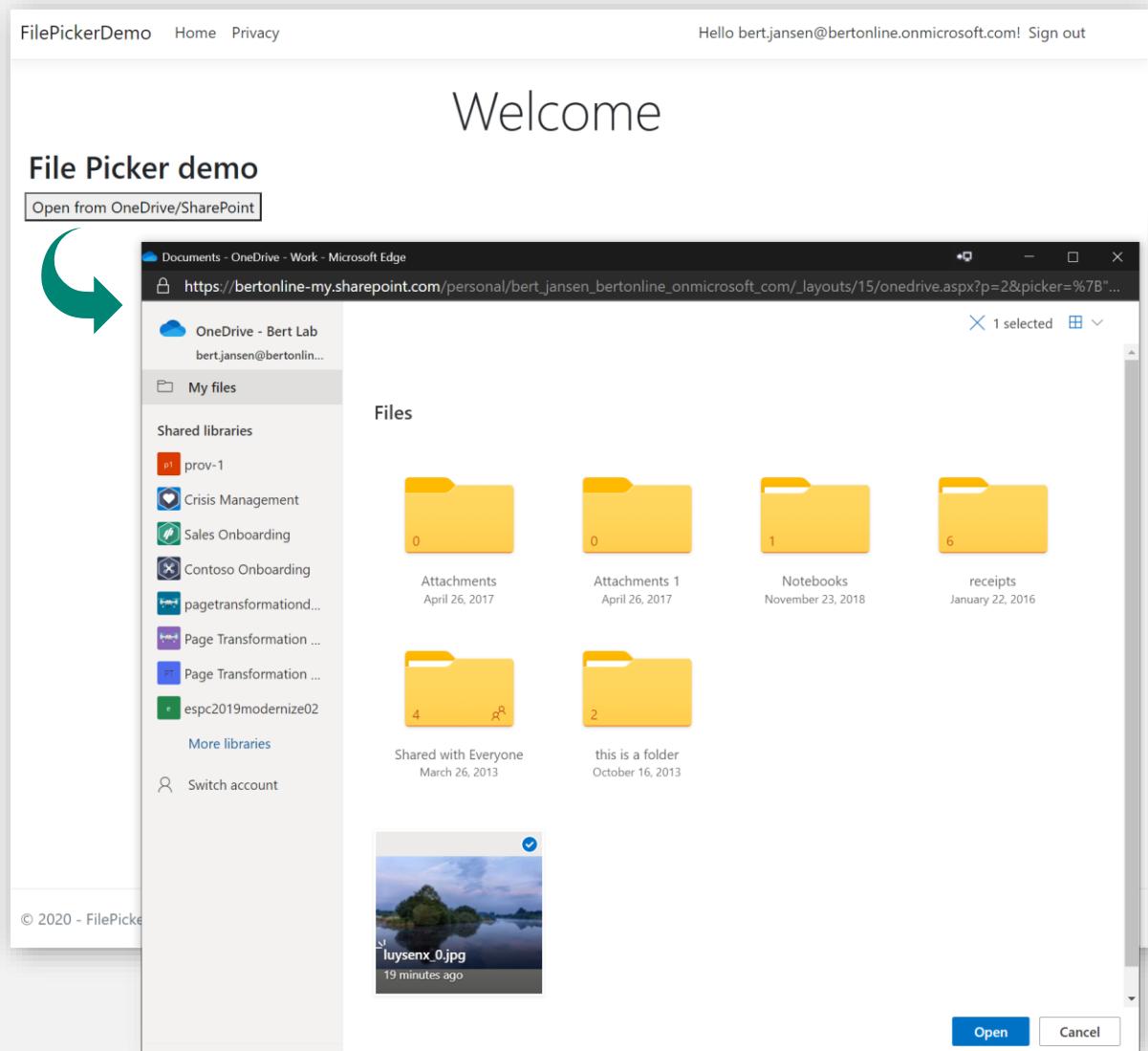
JavaScript library: <https://js.live.net/v7.2/OneDrive.js>

## Resources

[Opening files documentation](#)

[SPFX sample](#)

A new picker experience is in progress



# Uploading files

Control allowing file browsing and uploading

File Save mode: file upload via direct upload or upload location id's (for API access)

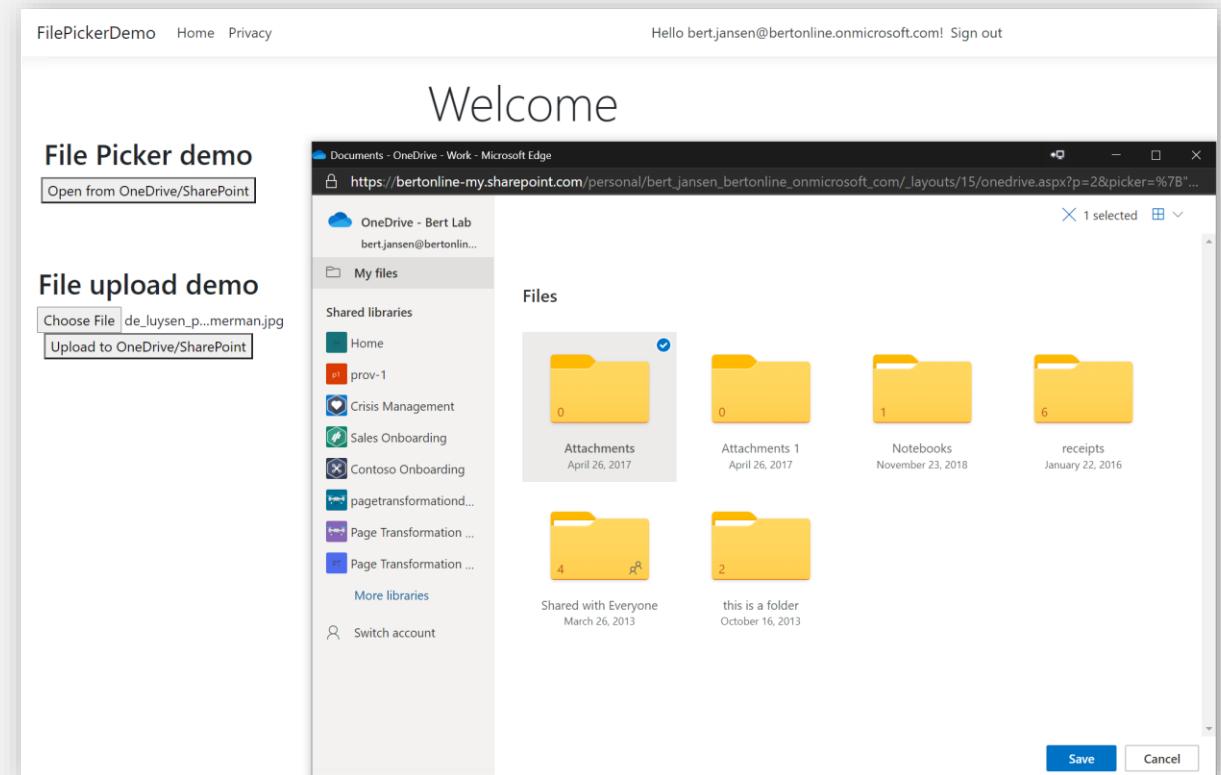
Implementation:

JavaScript library: <https://js.live.net/v7.2/OneDrive.js>

Resources

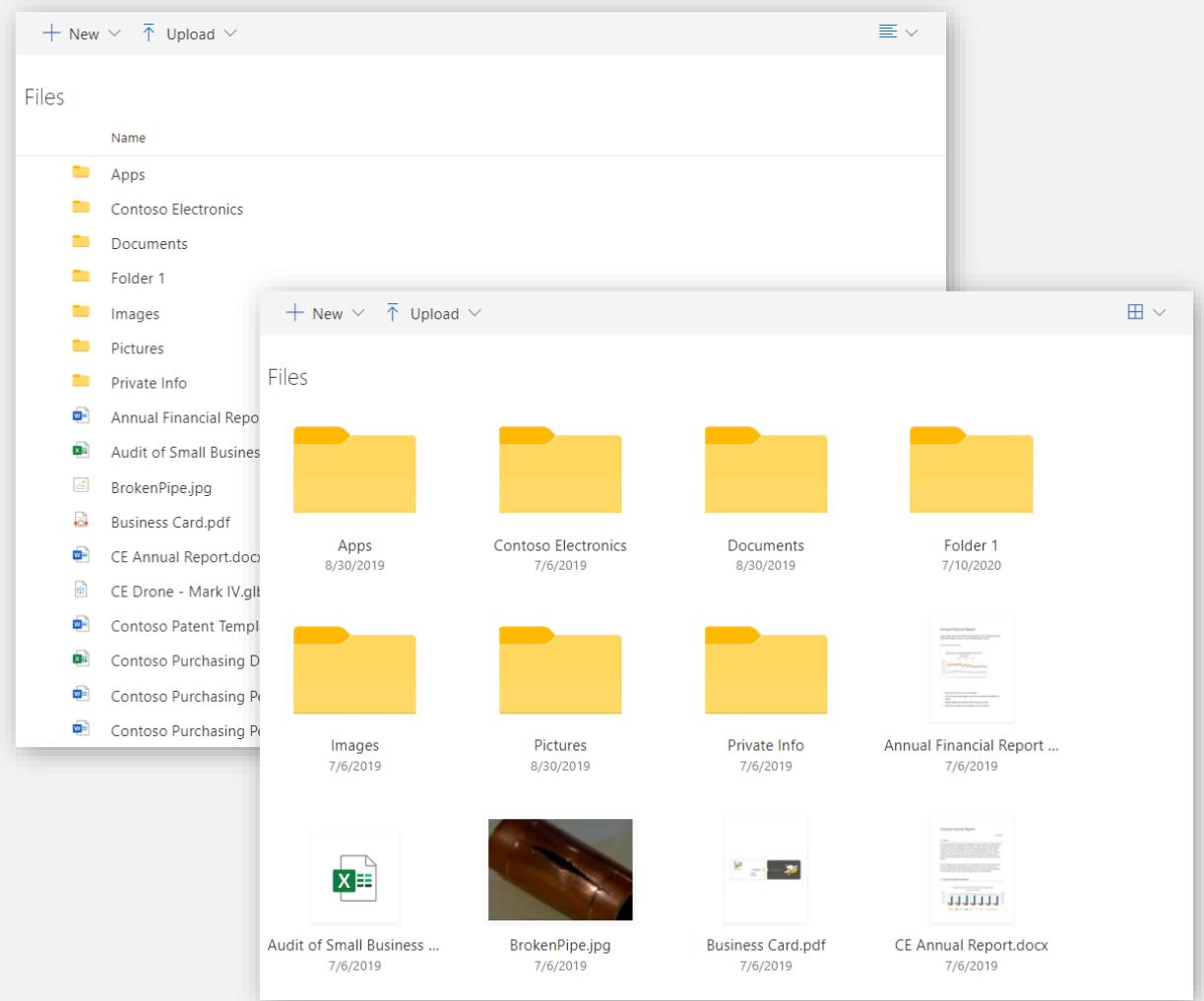
[Saving files documentation](#)

A new picker experience is in progress

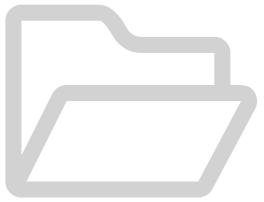


# Browsing files

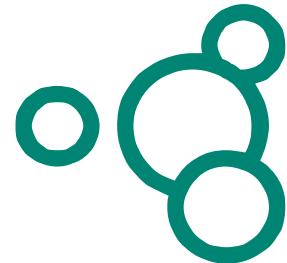
Embed a browsing control in your application that works similar as the browsing files in Microsoft's products like Office, SharePoint and Teams



Coming to preview soon!



Viewing, selecting  
and uploading files

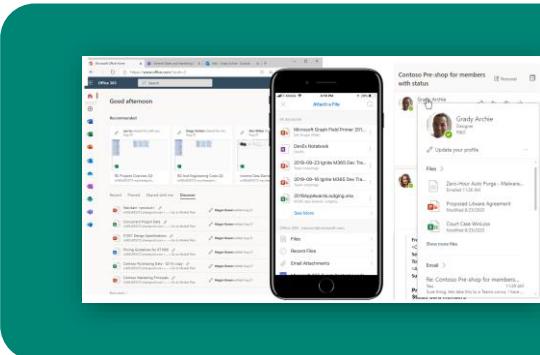


Deep integration  
via API's



Owning my  
file types

# Single source for personal and corporate data



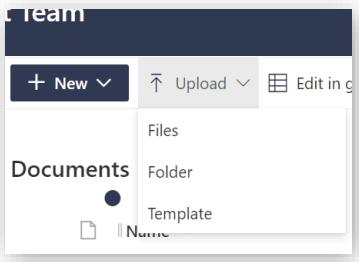
Files (drive/drive item) represents an item within a drive, like a document, photo, video, or folder

/v1.0/me/drive  
/v1.0/sites/{id}/drives  
/V1.0/sites/{id}/drive/items/{id}  
/v1.0/groups/{id}/drive

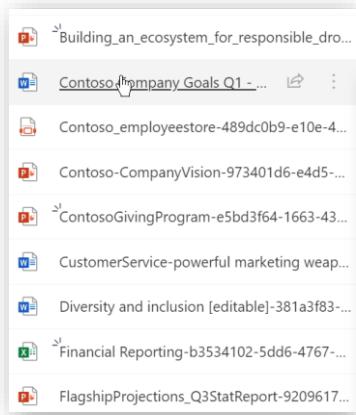


Microsoft Graph

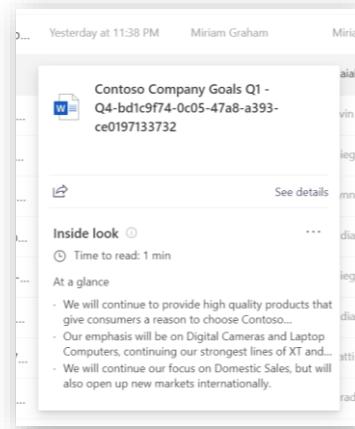
## Use in a file picker



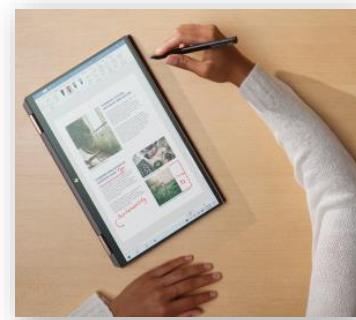
## Native file viewing



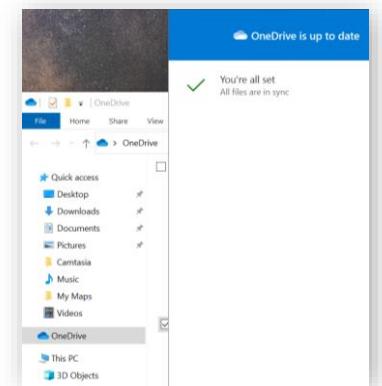
## Integrated search Exp.



## Doc gen & save



## Native file syncing



# Basic Microsoft Graph elements

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Sites – Contains lists, drives, and subsites

`/v1.0/sites/{site-id}`

Drive – Contains files and folders

DriveItem – A file or folder that is in a drive

`/v1.0/sites/{siteId}/drive/items/{item-Id}`

# File previews

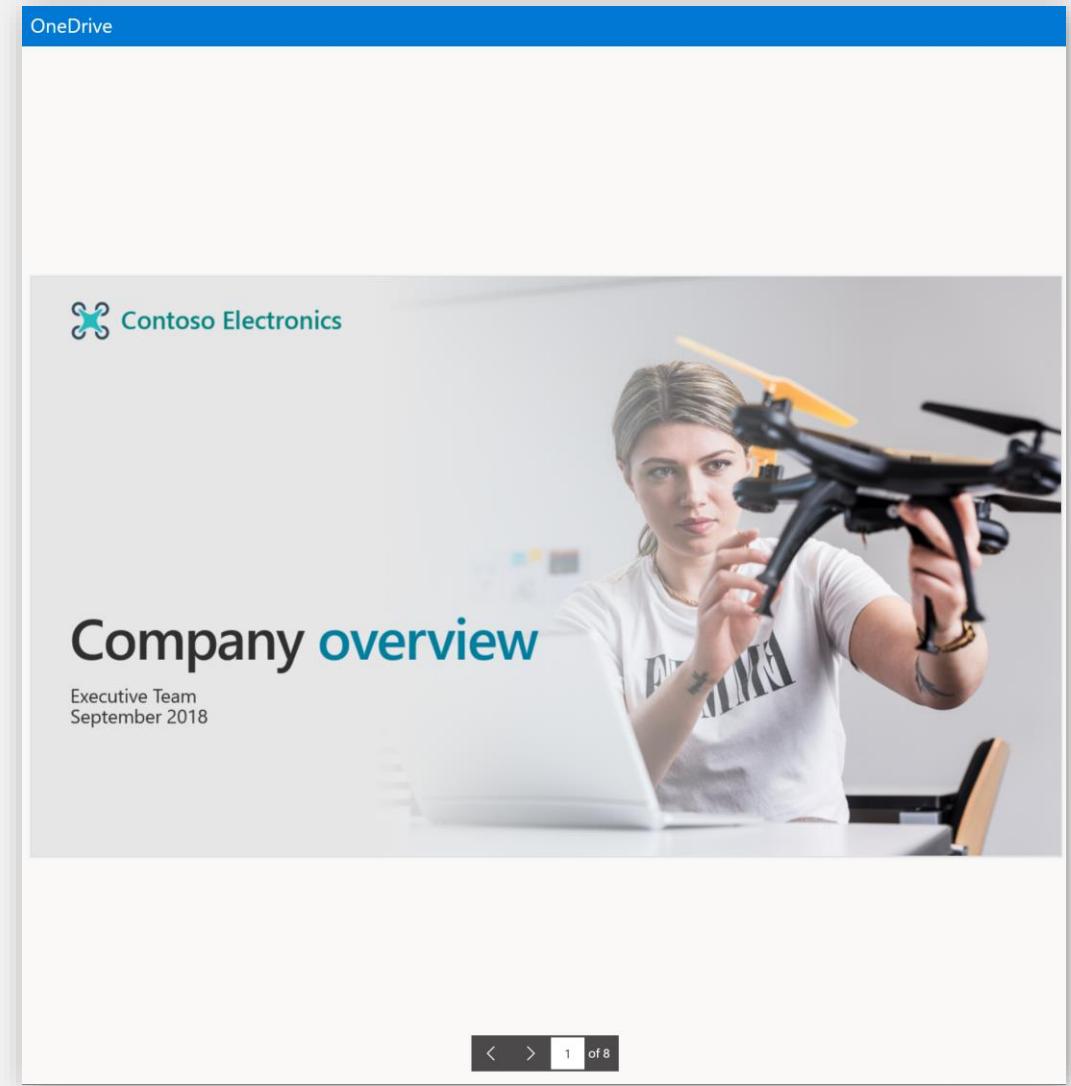
Graph API to get previews  
of [320+ file types](#)

- v1.0/me/drive/items/{id}/preview
- v1.0/sites/root/drives/{drive-id}/items/{id}/preview

```
{  
    "@odata.context": "https://graph.microsoft.com/v1.0/$metadata#microsoft.graph.itemPreviewInfo",  
    "getUrl": "https://bertonline.sharepoint.com/_layouts/15/embed.aspx?uniqueId=af3dde1a-f7af-4bde-  
    \"postParameters": null,  
    "postUrl": null  
}
```

## Resources

[File documentation](#)



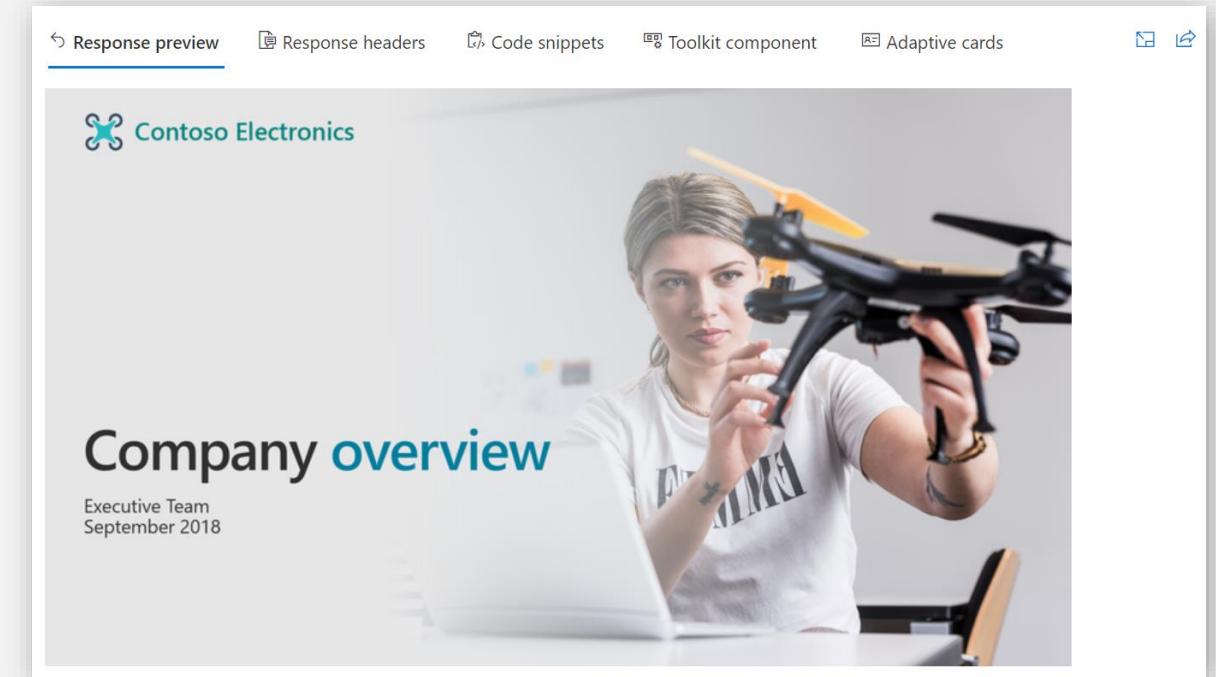
# File thumbnails

Graph API to get thumbnails  
of [320+ file types](#)

- v1.0/me/drive/items/{id}/thumbnails/0/large/content
- v1.0/sites/root/drives/{driveid}/items/{id}/thumbnails/0/large/content

## Resources

[File thumbnails documentation](#)



# Subscriptions and delta queries

Microsoft Graph based web hooks that you can use to be notified of events

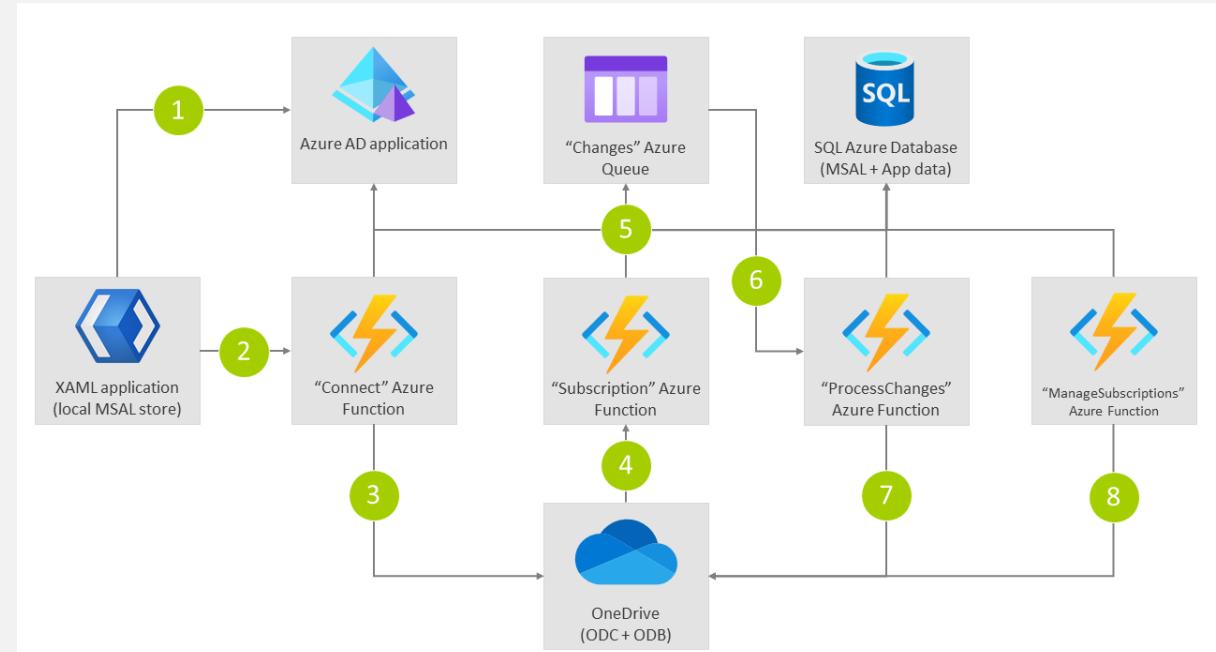
Delta queries to just get the changes since last time

Resources

[Subscription's documentation](#)

[Delta query documentation](#)

[OneDrive files integration sample \(.NET\)](#)



# Scan guidance

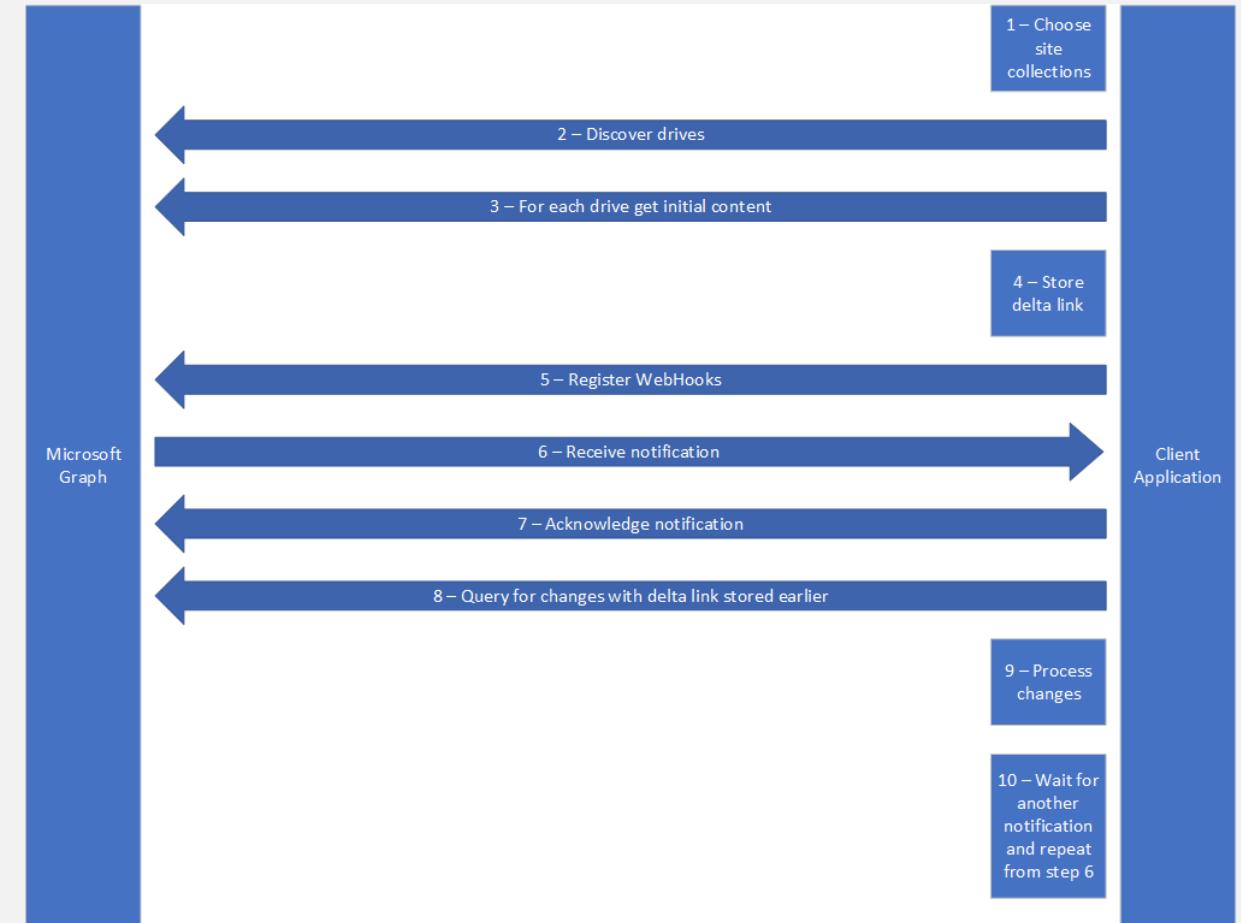
Best practices for discovering files and detecting changes at scale

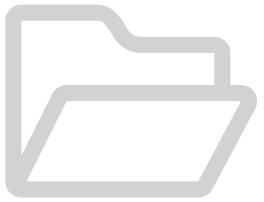
Continuously crawling all SharePoint content is not recommended, being notified of changes is a much better pattern

## Resources

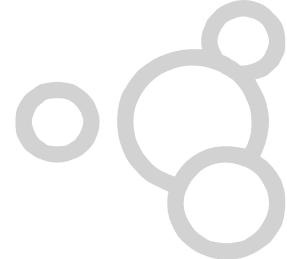
[Scan guidance documentation](#)

[Delta query documentation](#)





Viewing, selecting  
and uploading files



Deep integration  
via API's



Owning my  
file types

# File handlers

Enabling custom file experiences  
for your file types

- File preview
- Create new files in the browser
- Rich view/edit capability
- Custom actions that launch into your app
- Customized file icons

## Resources

[File handlers documentation](#)  
[Markdown sample file handler](#)

**Edit Markdown**

Close Save

```
1 # Title
2
3 Here is test content!! Very interesting test content...
4
5 ### And Another thing
6
7 > Here is a quote
8
9 |heading|heading|
10 |---|---|
11 value|value|
12 value|value|
13 value|value|
14 value|value|
```

**Title**  
Here is test content!! Very interesting test content...  
**And Another thing**  
Here is a quote  
**heading heading**  
value value  
value value  
value value  
value value

Open Share Copy link Download Delete Copy to Version history

**Preview**

**Title**  
Here is test content!! Very interesting test content...  
**And Another thing**  
Here is a quote  
**heading heading**  
value value  
value value  
value value  
value value

# Graph connectors

Enables ISV/third party specific data to appear in Microsoft search results

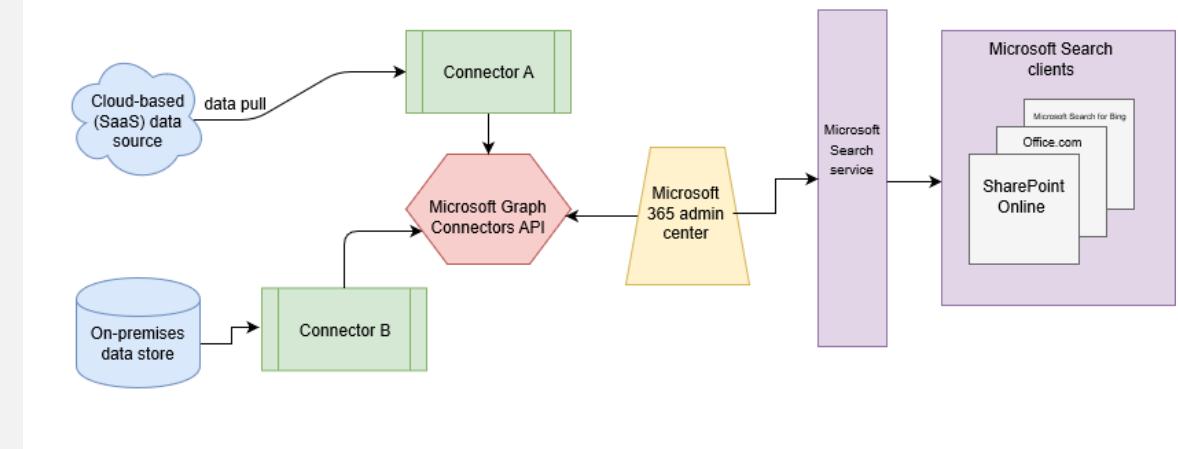
- Index your file data
- 9 Microsoft built connectors – 100+ 3rd party connectors

## Resources

[Graph connector documentation](#)

[Microsoft Graph connectors gallery](#)

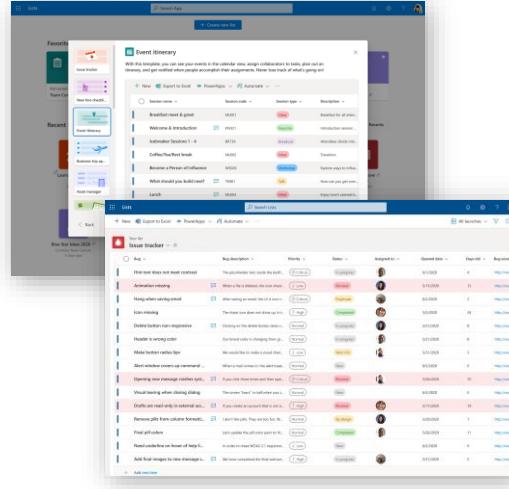
[Graph connector dotnet sample](#)



# List extensibility scenarios

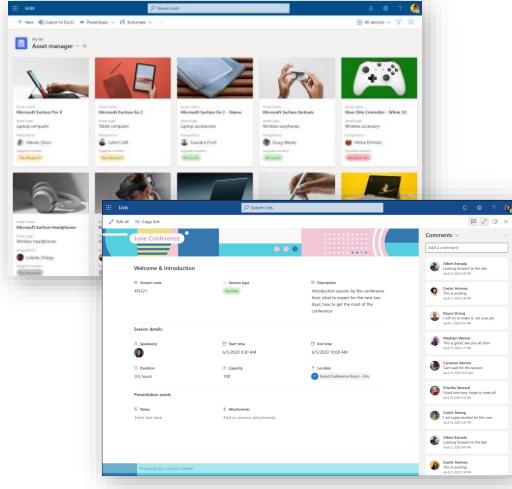
An overview of the extensibility options when working  
with lists in SharePoint

# Empowering business processes via Lists



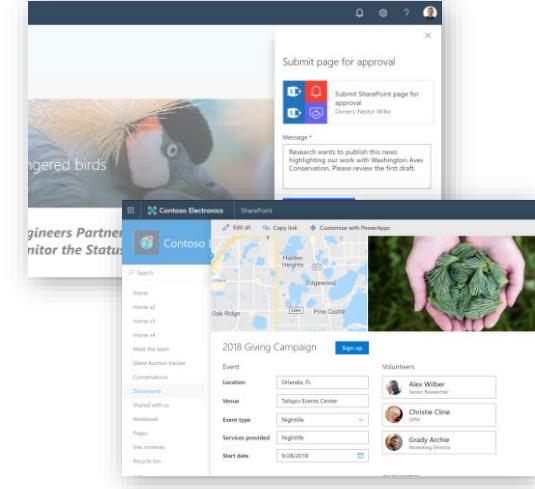
## Native efficiency

Collect, manage, and distribute content and data using SharePoint lists and libraries



## Simple configuration

Lists are the best way to organize the things your team cares about & must get done.



## Integrated solutions

Compose analytics, user experiences, and business processes using an integrated set of services from Microsoft.

Continuum

# Track what matters most with Microsoft Lists

## Simple

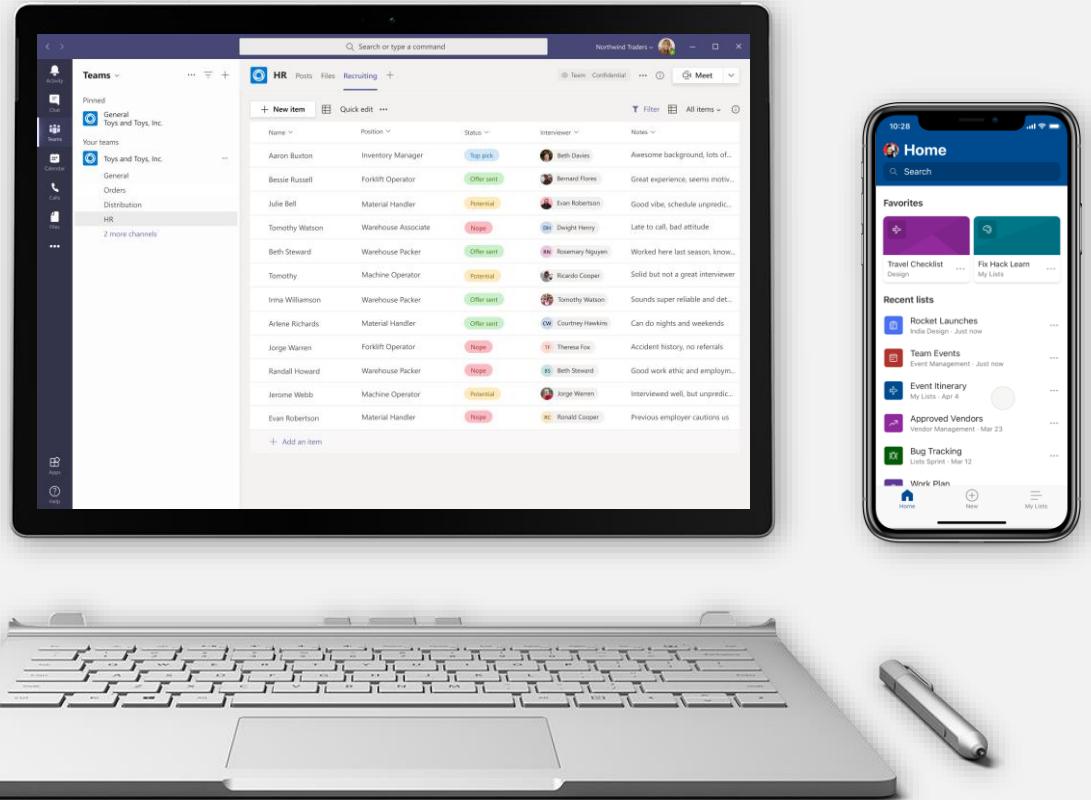
Easily create, share, and track lists with anyone, on any device

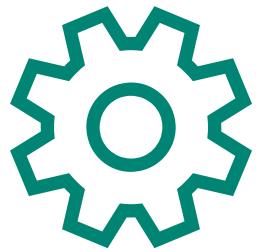
## Smart

Keep everyone in sync with rules and quick edits

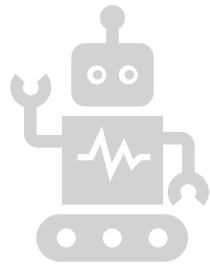
## Flexible

Customize your lists for whatever your business needs

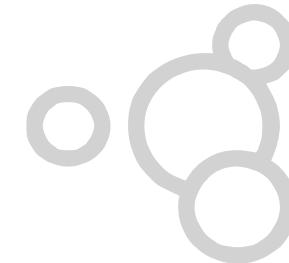




Simple  
configuration



Business process  
automation



Deep integration  
via API's

# List formatting: Columns

Use JSON to control how a column is displayed

- Out of the box designers available for power users
- Include formatting when you provision lists

## Resources

[Column formatting documentation](#)

[List formatting samples](#)

For more advanced scenarios involving custom code, checkout [SPFX Field Customizers](#)

Title	Effort (Days)	Assigned To	Status
Herd Cats	7	Sadettin Dogan	In Progress
Book fancy dinner for the team	4	Hanne Peterson	Done
Lock down demo environment	10	Chinh Phan	Blocked
Book flights	1	Miroslava Polakovicova	In Review



Title	Effort (Days)	Assigned To	Status
Herd Cats	7	Sadettin Dogan	→ In Progress
Book fancy dinner for the team	4	Hanne Peterson	✓ Done
Lock down demo environment	10	Chinh Phan	✗ Blocked
Book flights	1	Miroslava Polakovicova	⚠ In Review

# List formatting: Views

Use JSON to control how a view is presented

- Out of the box designers available for power users
- Include formatting when you provision lists

## Resources

[List formatting documentation](#)

[List formatting samples](#)

Title	Feedback	DueDate	+ Add column
Provide feedback on execution plan	Do more with less! Focus on customer requirements.	6/7/2018	
Provide feedback on executive retreat	A lot got done. The agenda was a bit hectic. The trapeze artists were a nice touch!	6/29/2018	
Provide feedback on happy hour menu	Truly world class!	6/5/2018	

Feedback List
Provide feedback on execution plan Do more with less! Focus on customer requirements. <a href="#">Give feedback</a>
Provide feedback on executive retreat A lot got done. The agenda was a bit hectic. The trapeze artists were a nice touch!
Provide feedback on morale event More drinks, please! <a href="#">Give feedback</a>

Feedback
Provide feedback on execution plan Do more with less! Focus on customer requirements
Provide feedback on executive event A lot got done. The agenda was a bit hectic. The trapeze artists were a nice touch!
Provide feedback on morale event More drinks, please!

# List form configuration

Configure how a list edit/view form is shown

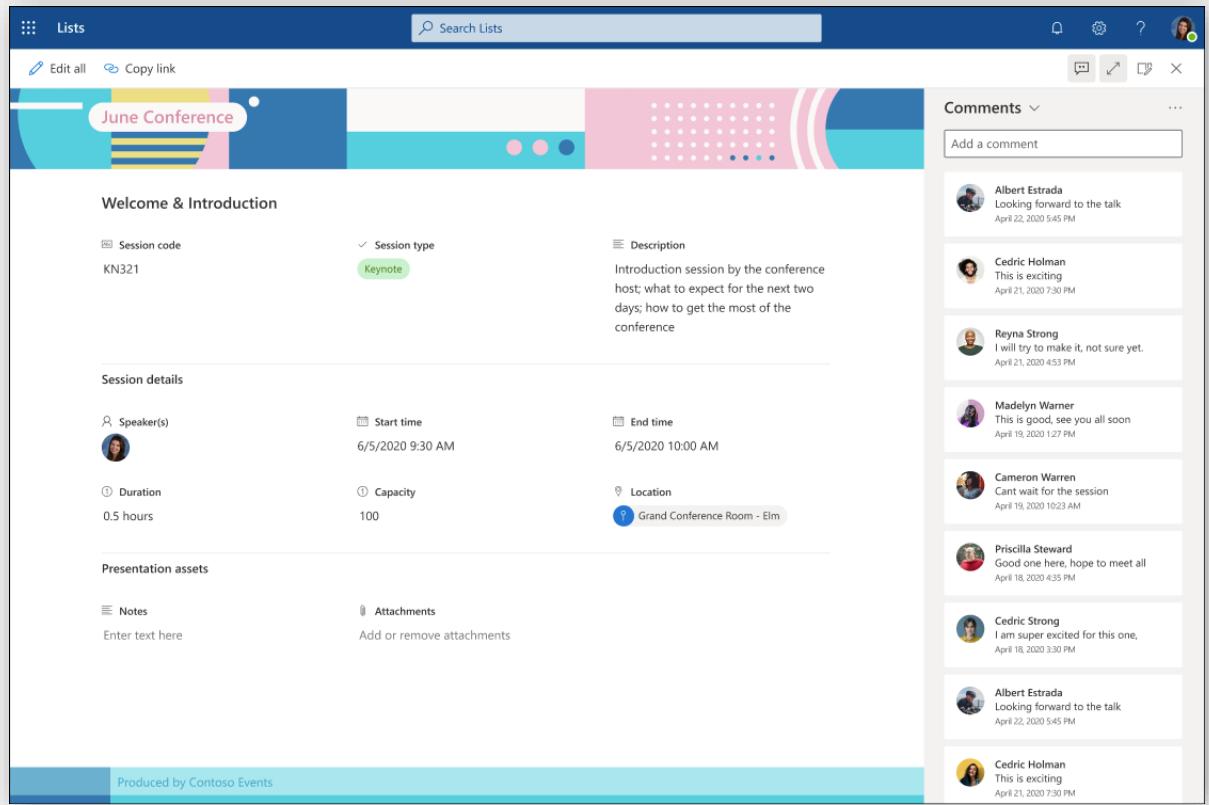
- Show, hide and reorder columns
- Conditional Show/Hide columns
- Use JSON to format form header/footer and create sections in the form

## Resources

[List form documentation](#)

[Configure the List form using formatting](#)

[List formatting samples](#)



# Power Apps integration

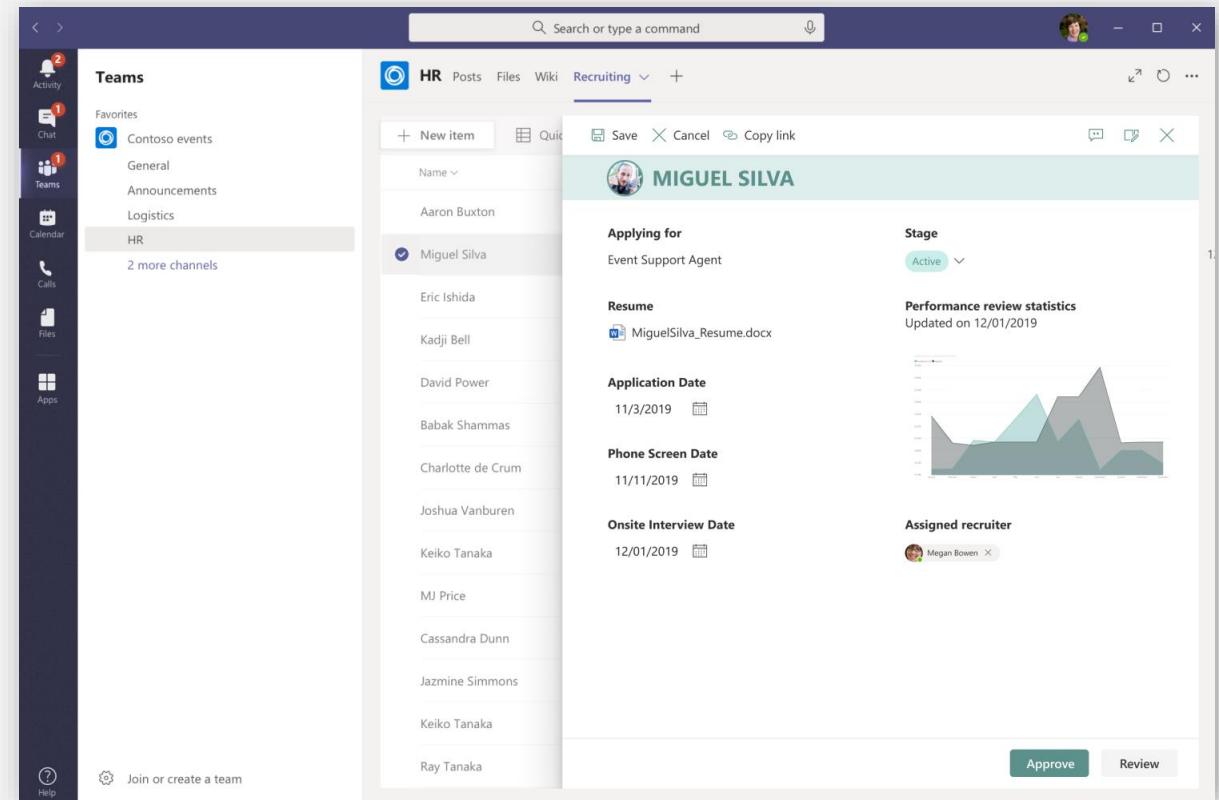
Customize your lists and library forms using Power Apps platform.

## Resources

[Power Apps documentation](#)

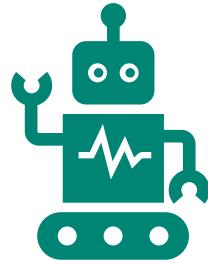
[Microsoft Lists Resource Center](#)

[Power Platform samples](#)

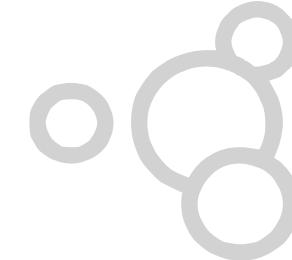




Simple  
configuration



Business process  
automation



Deep integration  
via API's

# List rules

Trigger a notification based upon rules.

Notify someone when:

- A column changes
- A column value changes
- A new item is created
- An item is deleted

## Resources

[Microsoft Lists Resource Center](#)

[Create a rule to automate a list](#)

The image contains two screenshots of the Microsoft Lists interface, demonstrating how to create rules for notifications.

**Screenshot 1: Create a rule - Sales Event itinerary - June Conference**

This screenshot shows the 'Create a rule' dialog box over a list of items. The dialog title is 'Create a rule' and it says 'Notify someone when'. It lists four options: 'A column changes', 'A column value is something', 'A new item is created', and 'An item is deleted'. Below these options, there's a link 'Learn more'.

**Screenshot 2: Create a rule - My list: Issue tracker**

This screenshot shows the 'Create a rule' dialog box for a list named 'Issue tracker'. The title is 'Create a rule' and it says 'Customize the condition by choosing a column, the value of the column, and who to notify.' A condition is selected: 'When a new item is created, send email to [enter a name]'. A suggestion 'Speakers' is shown in a dropdown. At the bottom right, there are 'Create' and 'Cancel' buttons.

# Power Automate integration

Enable business processes on top of lists & libraries via the SharePoint Connector

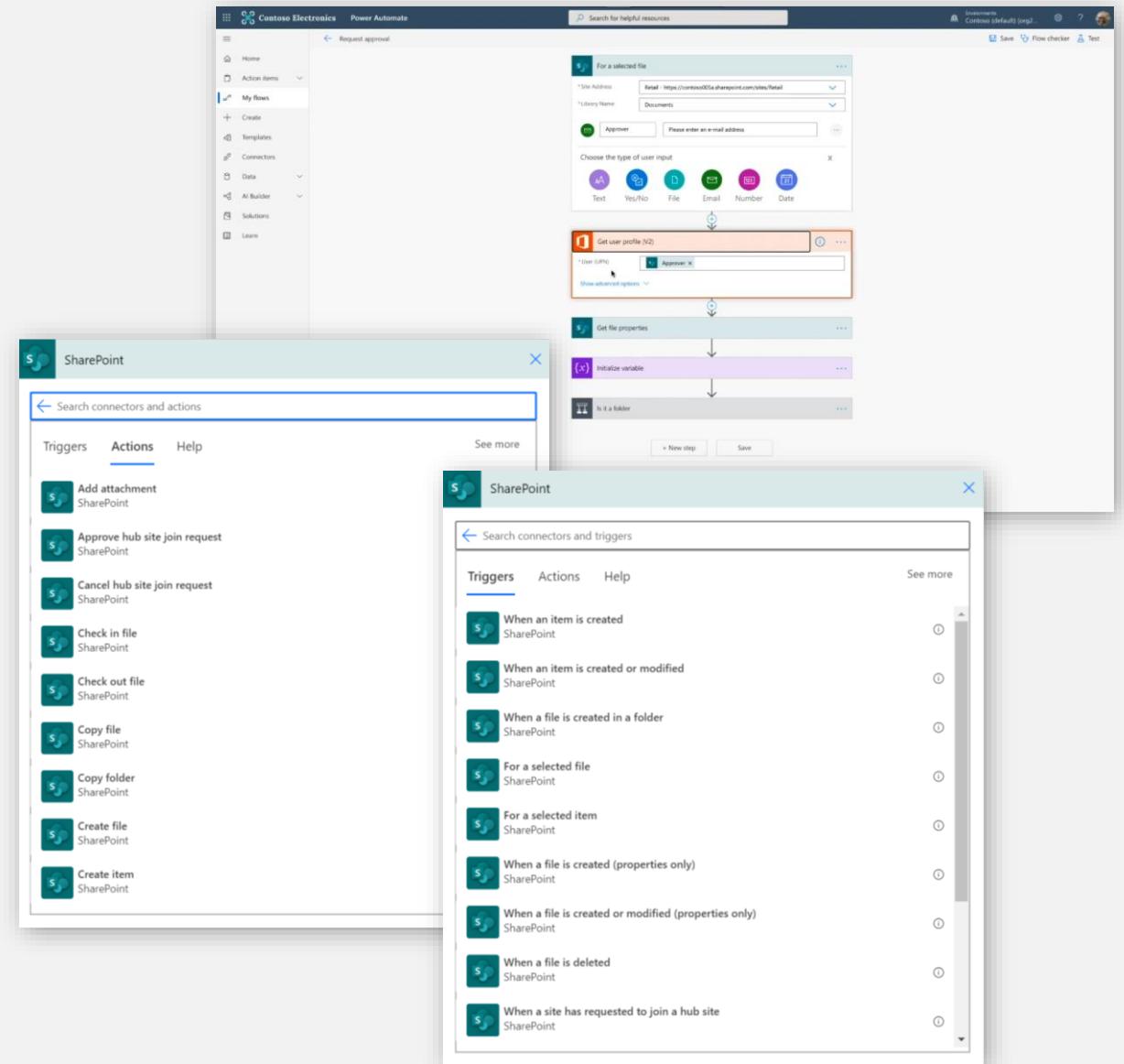
- Reminders on date columns
- Sign-off, content and page approvals
- Your custom business process

## Resources

[Microsoft Lists Resource Center](#)

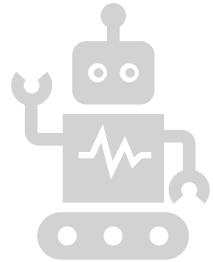
[SharePoint Power Automate Connector](#)

[Power Platform samples](#)

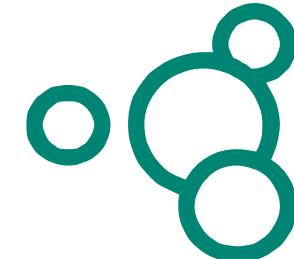




Simple  
configuration



Business process  
automation



Deep integration  
via API's

# Basic Microsoft Graph elements

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Sites – Contains lists, drives, and subsites

`/v1.0/sites/{site-id}`

List – Contains items, column definitions and content types

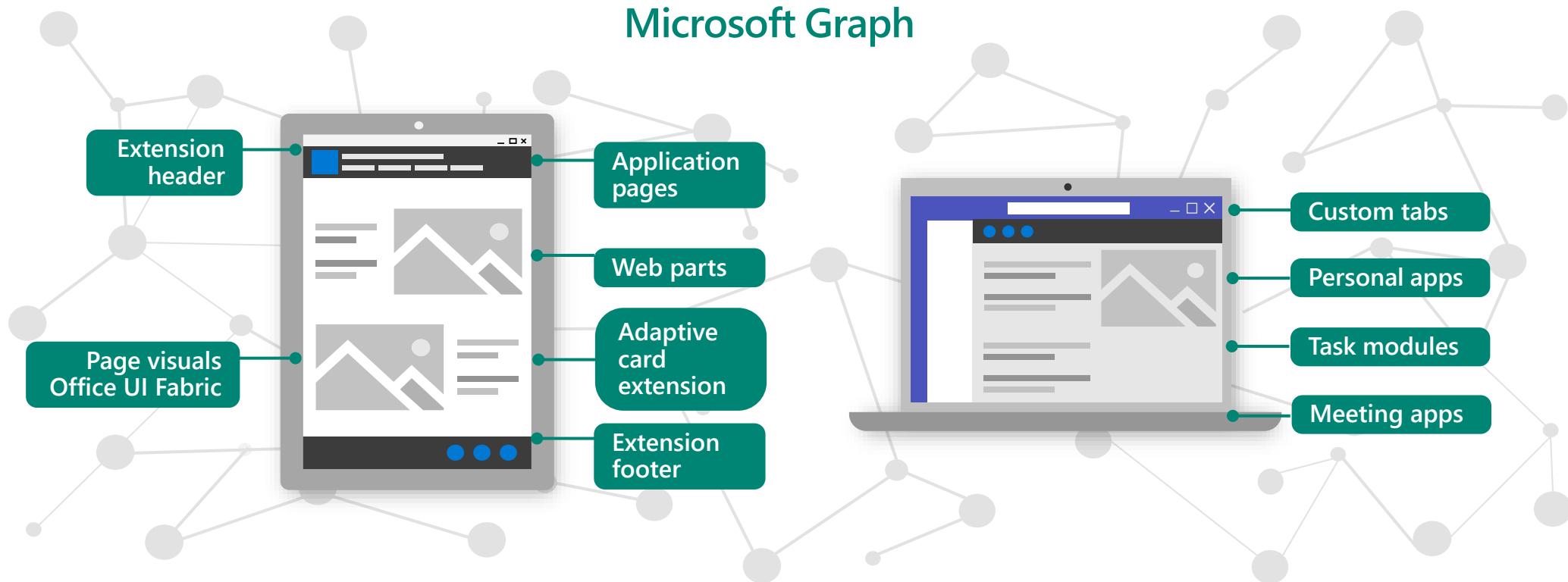
ListItem – The item data for the item in a list

`/v1.0/sites/{site-id}lists/{list-id}/items/{item-id}`

# SharePoint Framework

Using SharePoint Framework (SPFx) to extend  
and enrich the SharePoint and Microsoft Teams user experience

# What is SharePoint Framework?



*"An application framework used to build and extend modern experiences in SharePoint and in Microsoft Teams"*

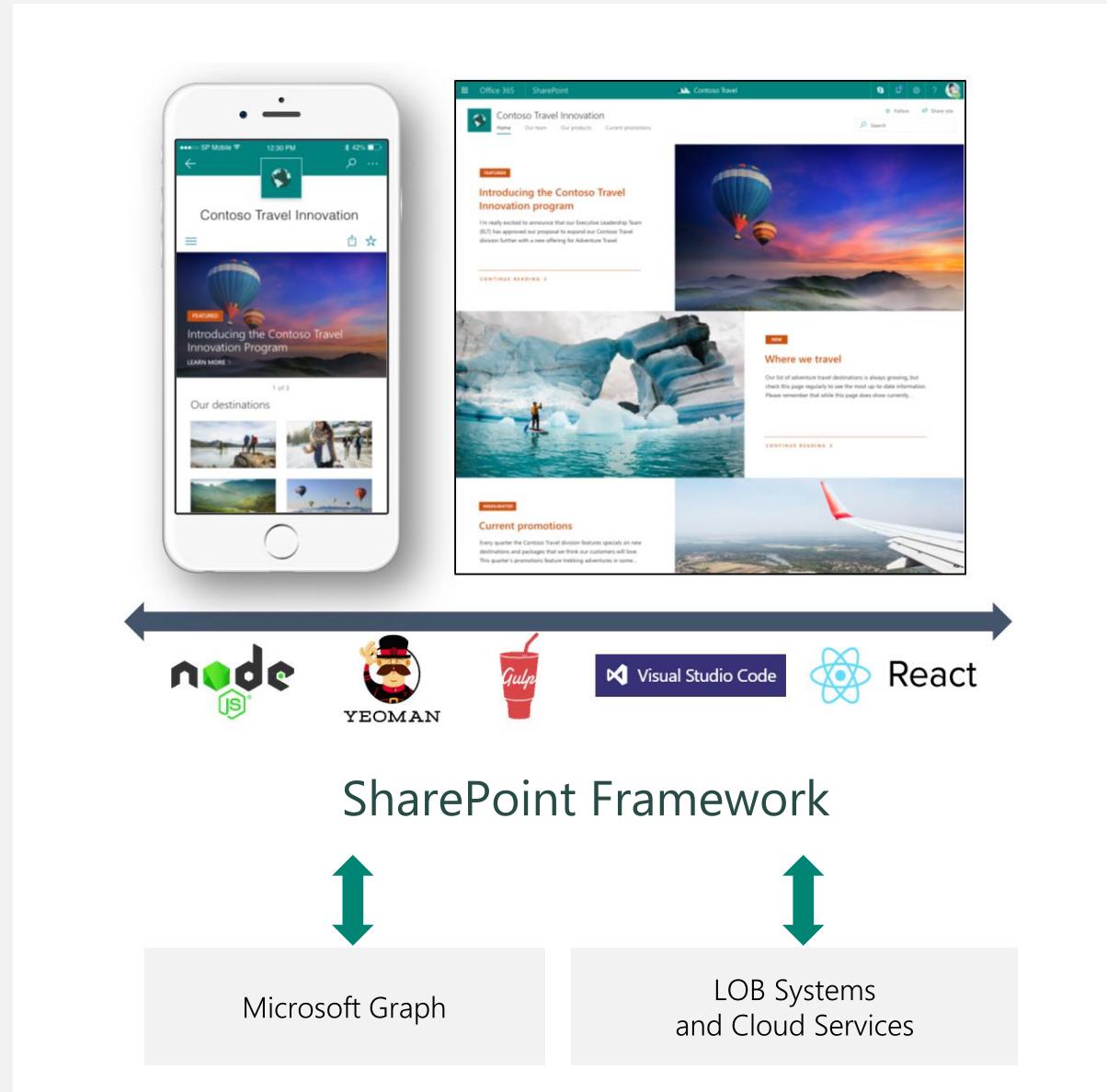
SPFx was publicly announced May 4th, 2016

# SharePoint Framework (SPFx)

- Modern client-side development
- Lightweight web and mobile
- Powers our own experiences
- Backward compatible
- Supports open-source tools and JavaScript web frameworks

## Resources

[SharePoint Framework Tutorials](#)



# Web parts

Controls that appear inside a SharePoint page and execute client-side in the browser

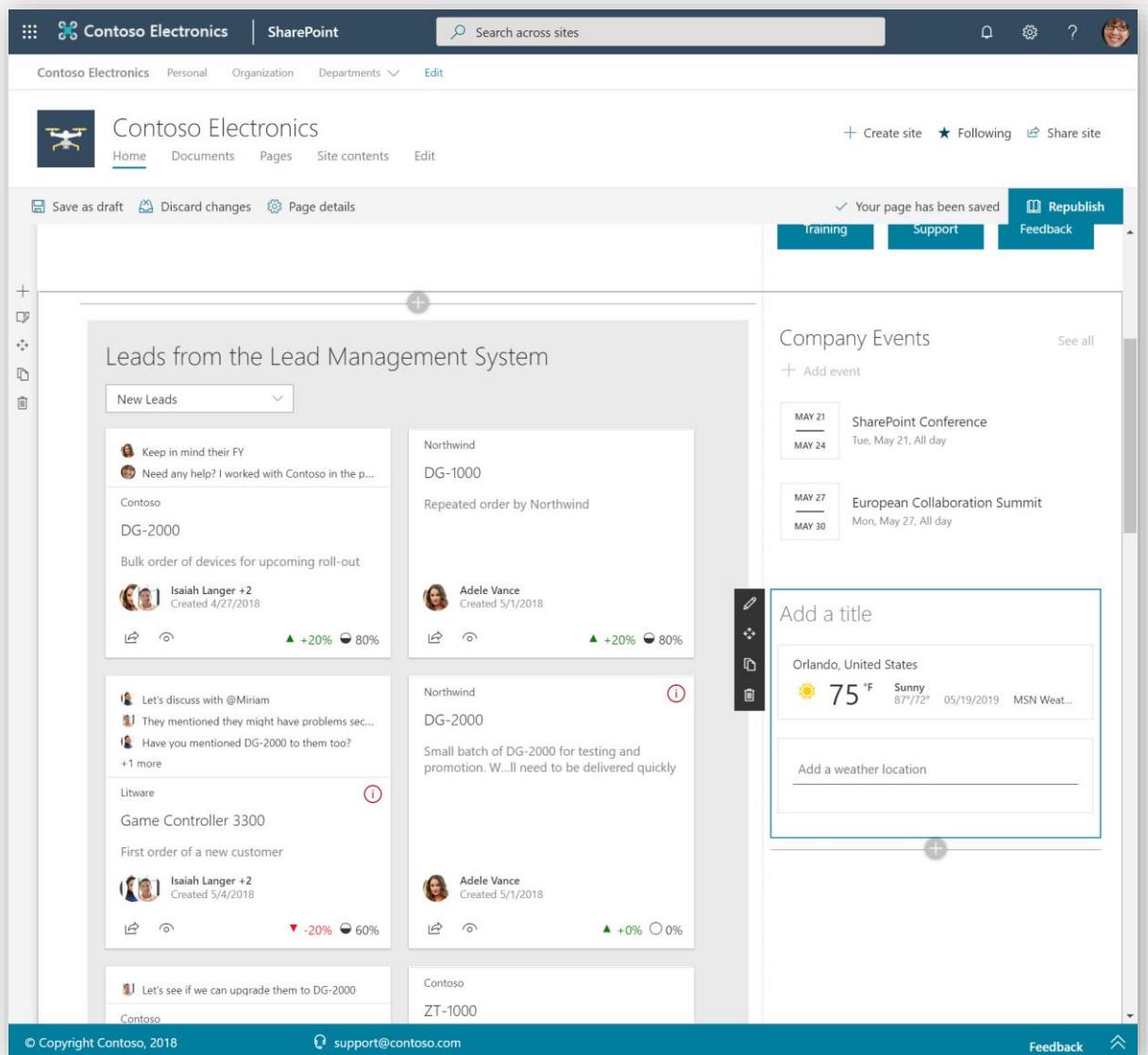
## Resources

[SharePoint Framework documentation](#)

[Develop web parts with the SharePoint Framework](#)

[SharePoint Framework \(SPFx\) Web Part Samples](#)

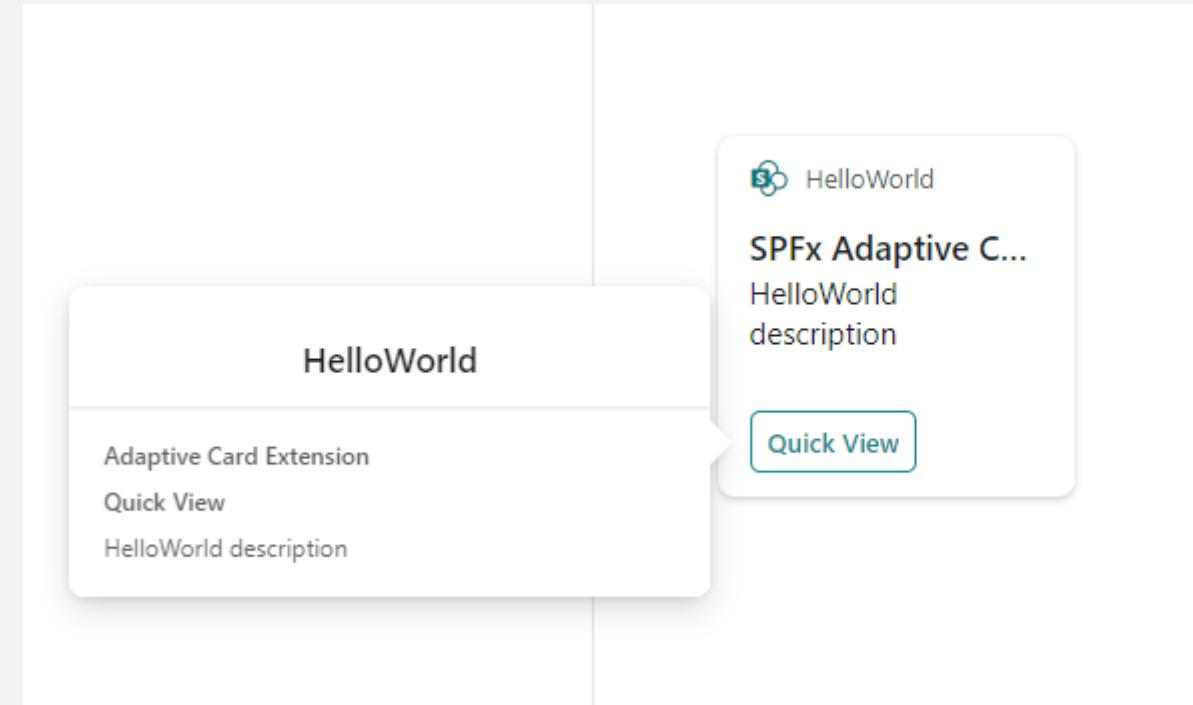
[Microsoft Teams development samples \(includes SPFx web parts\)](#)



# Adaptive card extensions (coming)

Adaptive Card Extensions (ACEs) are a new SharePoint Framework component type, which enable developers to build rich, native extensions to Viva Connections' Dashboards and SharePoint Pages

## Resources



# Use web parts across services

## Web parts

This screenshot shows a SharePoint page titled 'Contoso Electronics'. On the left, there's a navigation bar with links like 'Home', 'Documents', 'Pages', and 'Site contents'. A 'Leads from the Lead Management System' web part is displayed, listing various leads with their details and status. One lead is highlighted: 'Northwind DG-1000 Repeated order by Northwind'.

## App pages

This screenshot shows a SharePoint app page titled 'comms'. It features a 'Leads from the Lead Management System' web part. The interface includes a search bar at the top and a 'New Leads' button. Below, it lists leads from different companies, such as 'Northwind DG-1000 Repeated order by Northwind' and 'Contoso DG-2000 Bulk order of devices for upcoming roll-out'.

## Teams tabs

### Personal Teams apps

This screenshot shows a Microsoft Teams tab for 'Sales and Marketing > Opportunities'. The card displays opportunities from the Lead Management System, including 'Northwind DG-1000 Repeated order by Northwind' and 'Contoso ZT-1000 Repeated order by Contoso'.

## Teams meeting apps

This screenshot shows a Microsoft Teams meeting app titled 'Release Planning'. It features a 'New Question' card where users can input questions related to the release planning process.

# Application customizers

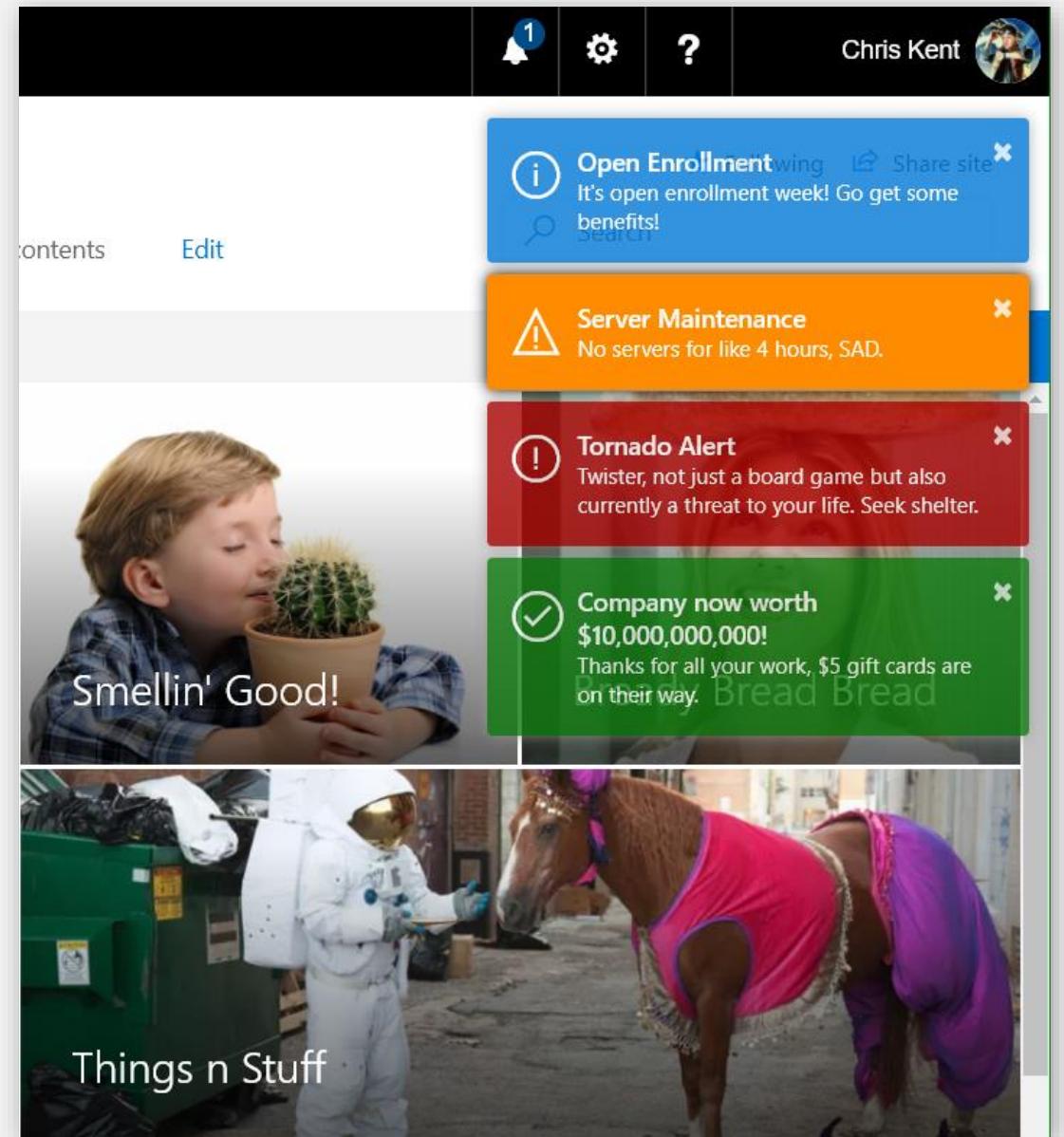
Adds scripts to the page, and  
accesses well-known HTML element  
placeholders and extends them  
with custom renderings

## Resources

[SharePoint Framework documentation](#)

[Extend the SharePoint user interface with SPFx extensions](#)

[SharePoint Framework \(SPFx\) Extensions Samples](#)



# Field customizers

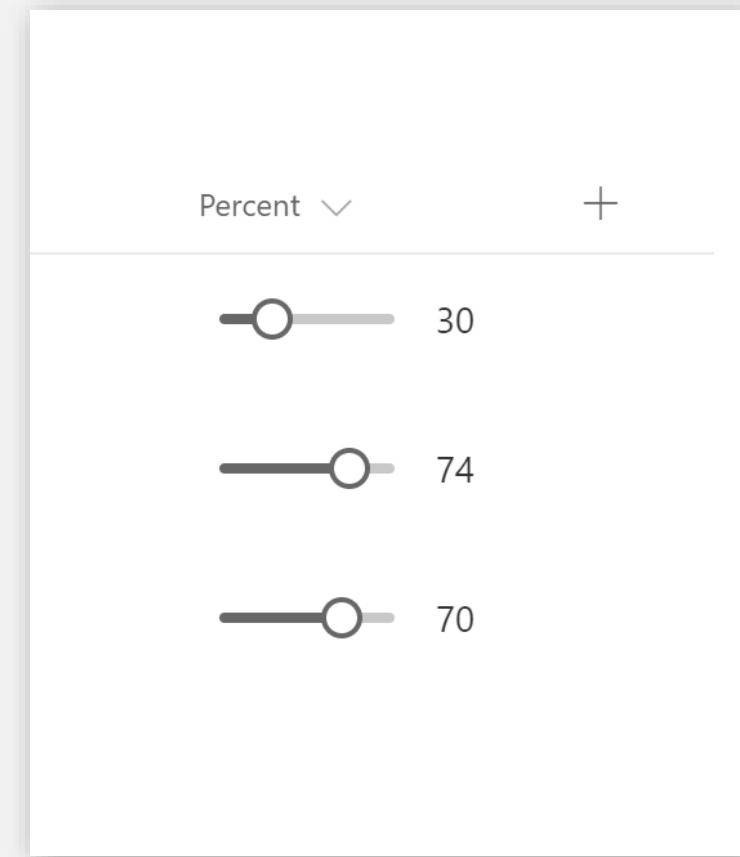
Provides modified views to data  
for fields within a list

## Resources

[SharePoint Framework documentation](#)

[Extend the SharePoint user interface with SPFx extensions](#)

[SharePoint Framework \(SPFx\) Extensions Samples](#)



# Command sets

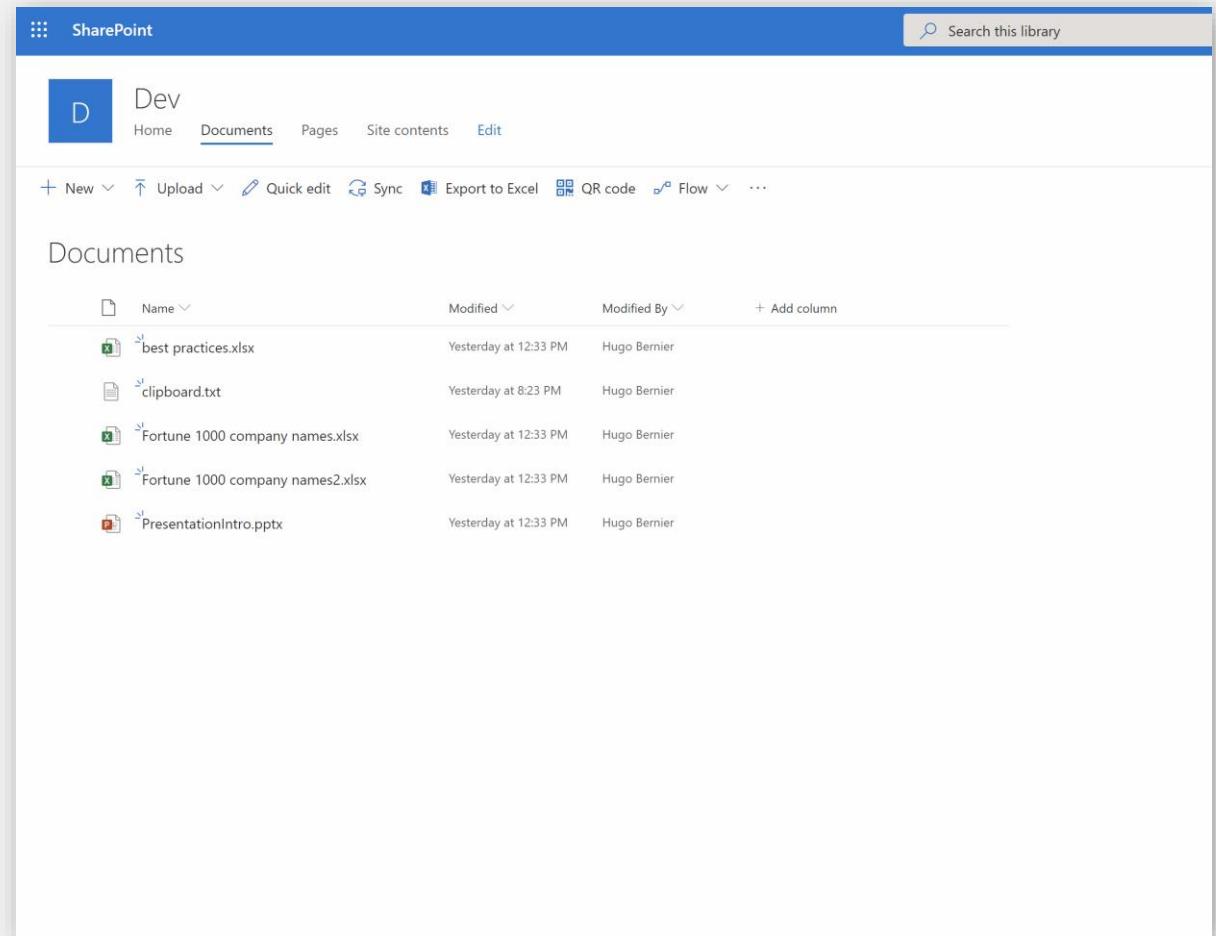
Extends the SharePoint command surfaces to add new actions, and provides client-side code that you can use to implement behaviors

## Resources

[SharePoint Framework documentation](#)

[Extend the SharePoint user interface with SPFx extensions](#)

[SharePoint Framework \(SPFx\) Extensions Samples](#)



# Search Query extension

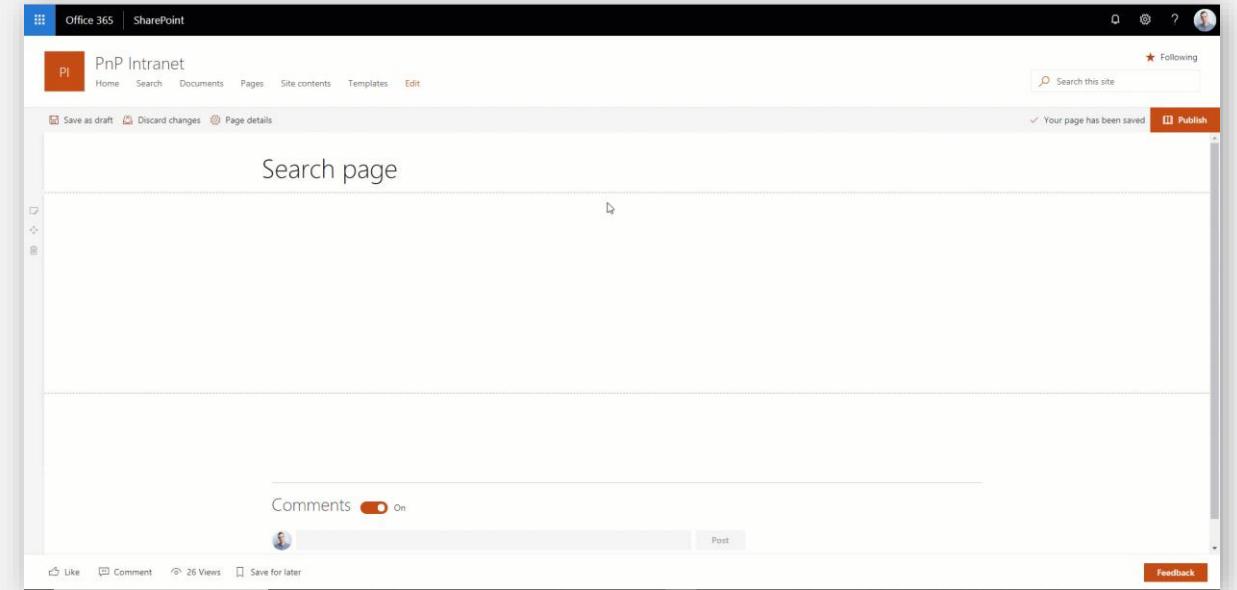
Allows you to manipulate the user's search query before it is sent to SharePoint

## Resources

[SharePoint Framework documentation](#)

[PnP Modern Search](#)

[Getting started with Search Query extensions](#)



# Library components

The library component type in the SharePoint Framework (SPFx) enables you to have independently versioned and deployed code served automatically for your SharePoint Framework components

## Resources

[SharePoint Framework documentation](#)

[SharePoint Framework Library component overview](#)

[SharePoint Framework Library samples](#)

## How to create a third-party SPFx library

1. Create a new project directory in your favorite location

```
Console
```

```
md corporate-library
```

2. Go to the project directory

```
Console
```

```
cd corporate-library
```

3. Create a new library by running the Yeoman SharePoint Generator

```
Console
```

```
yo @microsoft/sharepoint
```

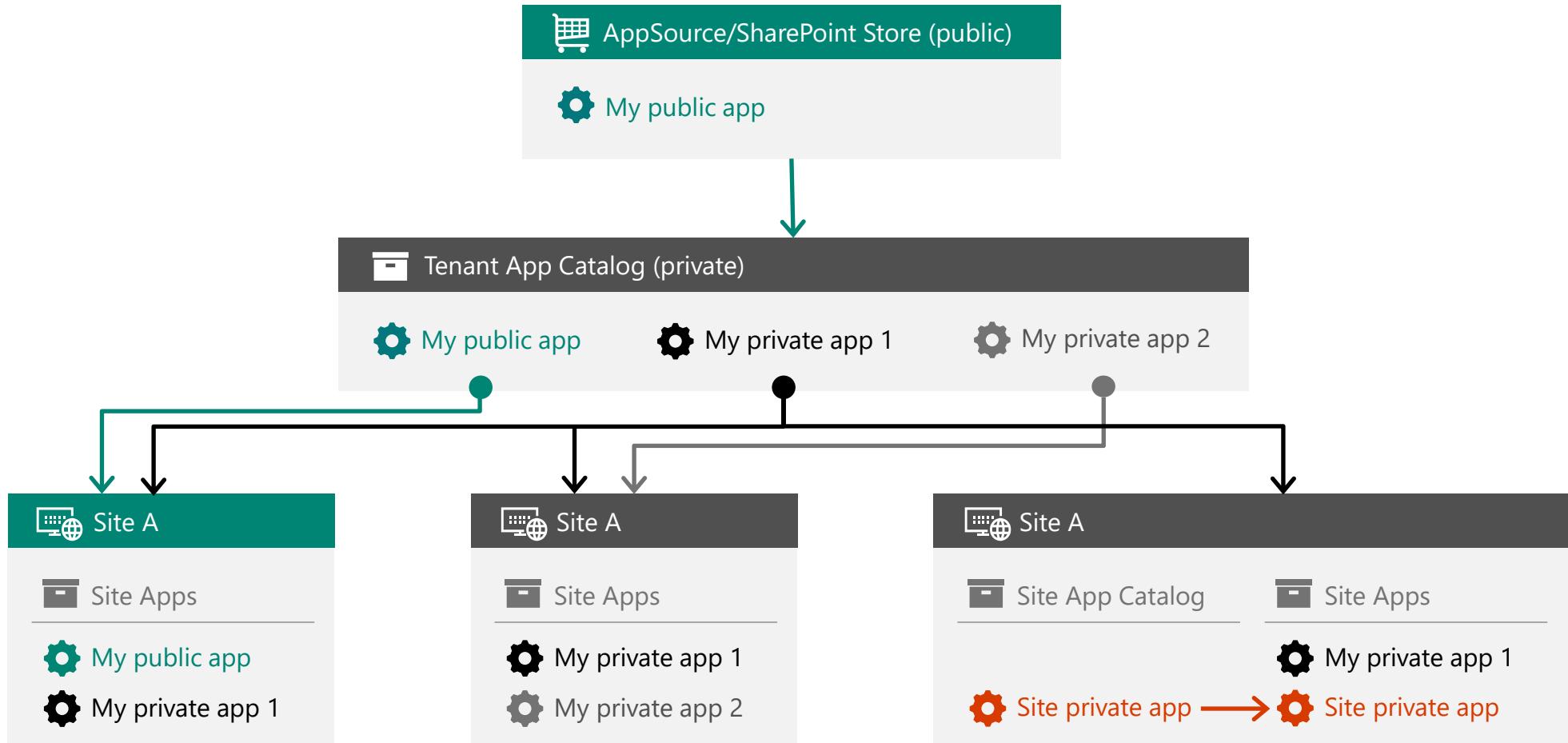
4. When prompted, enter the following values (*select the default option for all prompts omitted below*):

- Do you want to allow the tenant admin the choice of being able to deploy the solution to all sites immediately without running any feature deployment or adding apps in sites?: Yes
- Which type of client-side component to create?: Library
- What is your Library name?: CorporateLibrary
- What is your Library description?: CorporateLibrary description

# **Deployment and configuration**

Take control over how users create sites, make your apps available to the SharePoint users

# App deployment options



# App source

Public store for SharePoint, Teams and Office apps

## Resources

[App source documentation](#)

[Microsoft App Source](#)

The screenshot shows the Microsoft AppSource website interface. At the top, there's a navigation bar with links for Microsoft, AppSource, Apps, Consulting Services, and a search bar labeled "Search Microsoft AppSource". Below the navigation is a sidebar with sections for "Products" (Web Apps, Add-ins, Dynamics 365, Microsoft 365), "Categories" (Analytics, Collaboration, Customer Service, Finance, Human Resources, IT & Management Tools, Marketing, Operations & Supply Chain, Productivity, Sales, Content Management, CRM, File Managers, News & Weather, Project Management, Reference, Site Design, Social, Training & Tutorial, Utilities), and "Industries" (Agriculture, Architecture & Construction, Automotive, Distribution, Education, Financial Services, Government, Healthcare, Hospitality & Travel, Manufacturing & Resources, Media & Communications, Other Public Sector Industries). The main area displays "App results (1485)" in a grid format. Each result card includes the app icon, name, developer, rating (e.g., 4.5 stars), price (e.g., Free), and a "Get it now" button. Some cards also mention additional purchase requirements.

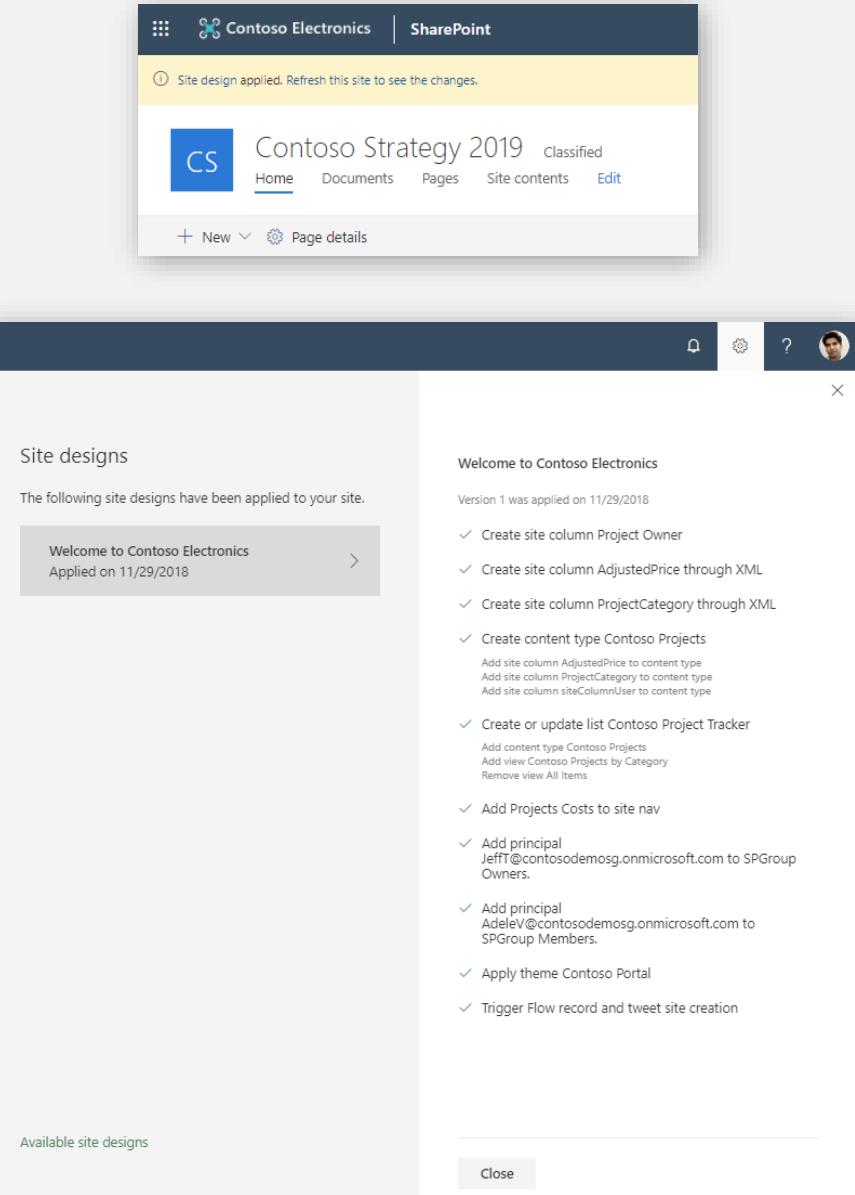
# Site designs and site scripts

## Automate SharePoint provisioning to new or existing SharePoint

- Create SharePoint artefacts such as lists, libraries, content types
- Update navigation and apply branding
- Configure security
- Deploy apps
- Trigger Power Automate for custom coded provisioning tasks

## Resources

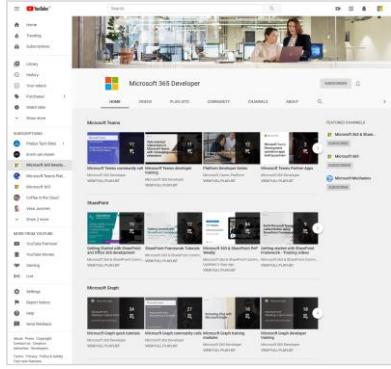
[Site design and site scripts documentation](#)



# Open source software

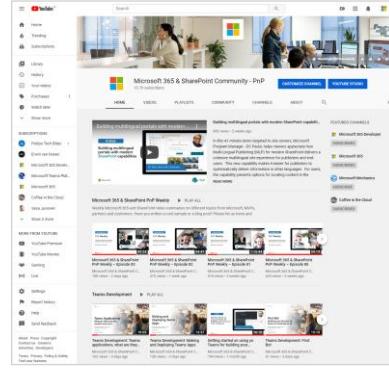
There's a very vibrant community of Microsoft developers building open source for SharePoint, OneDrive and Microsoft Graph

# Open-source software



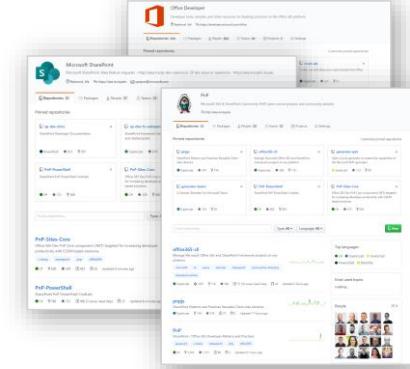
## Microsoft 365 developer videos

[aka.ms/M365DevYouTube](https://aka.ms/M365DevYouTube)



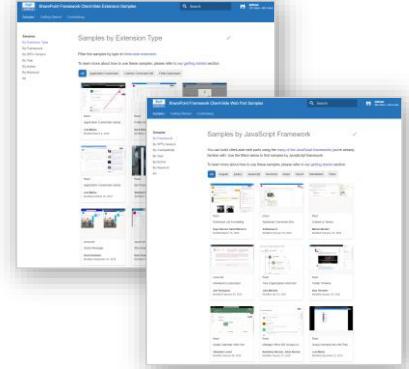
## Microsoft 365 & SharePoint community (PnP) videos

[aka.ms/m365pnp-videos](https://aka.ms/m365pnp-videos)



## Open source

[github.com/sharepoint](https://github.com/sharepoint)  
[github.com/pnp](https://github.com/pnp)  
[github.com/officedev](https://github.com/officedev)  
[github.com/microsoftgraph](https://github.com/microsoftgraph)



## Sample galleries

[aka.ms/spfx-webparts](https://aka.ms/spfx-webparts)  
[aka.ms/spfx-extensions](https://aka.ms/spfx-extensions)  
[aka.ms/list-formatting](https://aka.ms/list-formatting)  
[aka.ms/teams-samples](https://aka.ms/teams-samples)



## Initiatives

[aka.ms/m365pnp](https://aka.ms/m365pnp)



Thank you