

Developing for Microsoft Teams



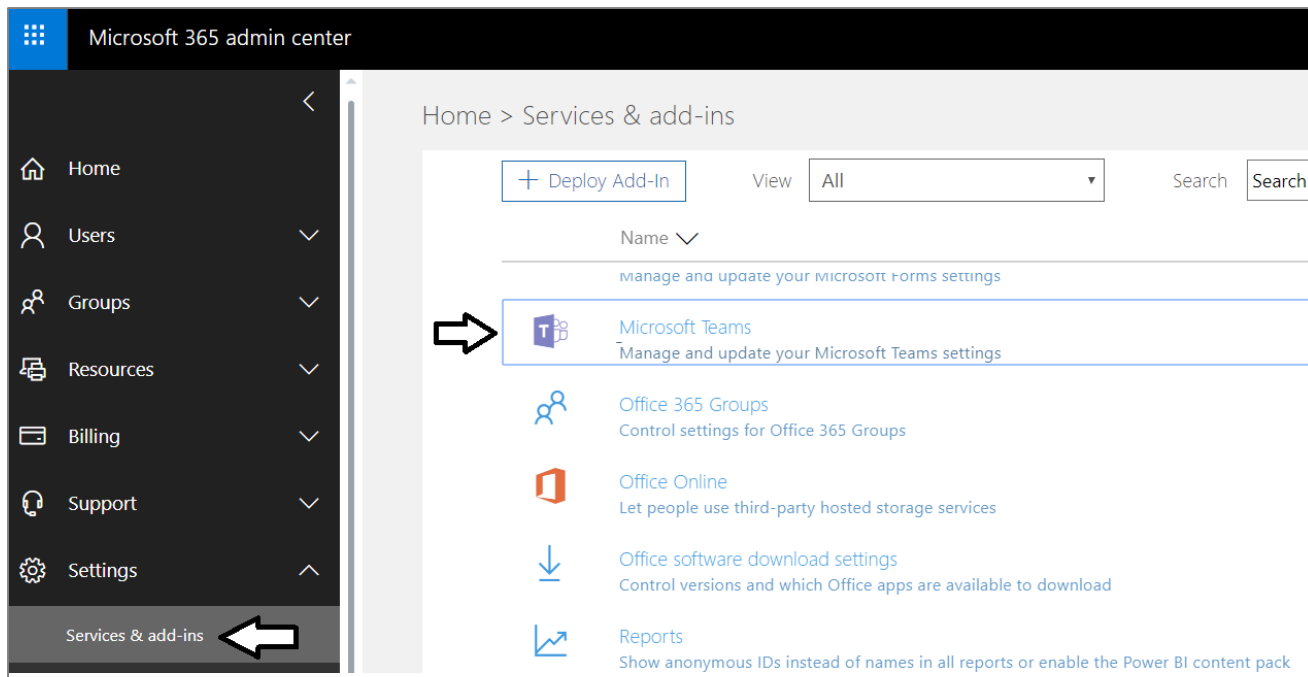
Agenda

- Understanding the Teams Service, Teams and Channels
- Developing Team Apps with Tabs, Bots and Connectors
- Developing a Teams App using App Studio
- Developing a Teams App using Visual Studio and C#
- Developing a Teams App using Node.js
- Packaging and Publishing a Microsoft Teams App

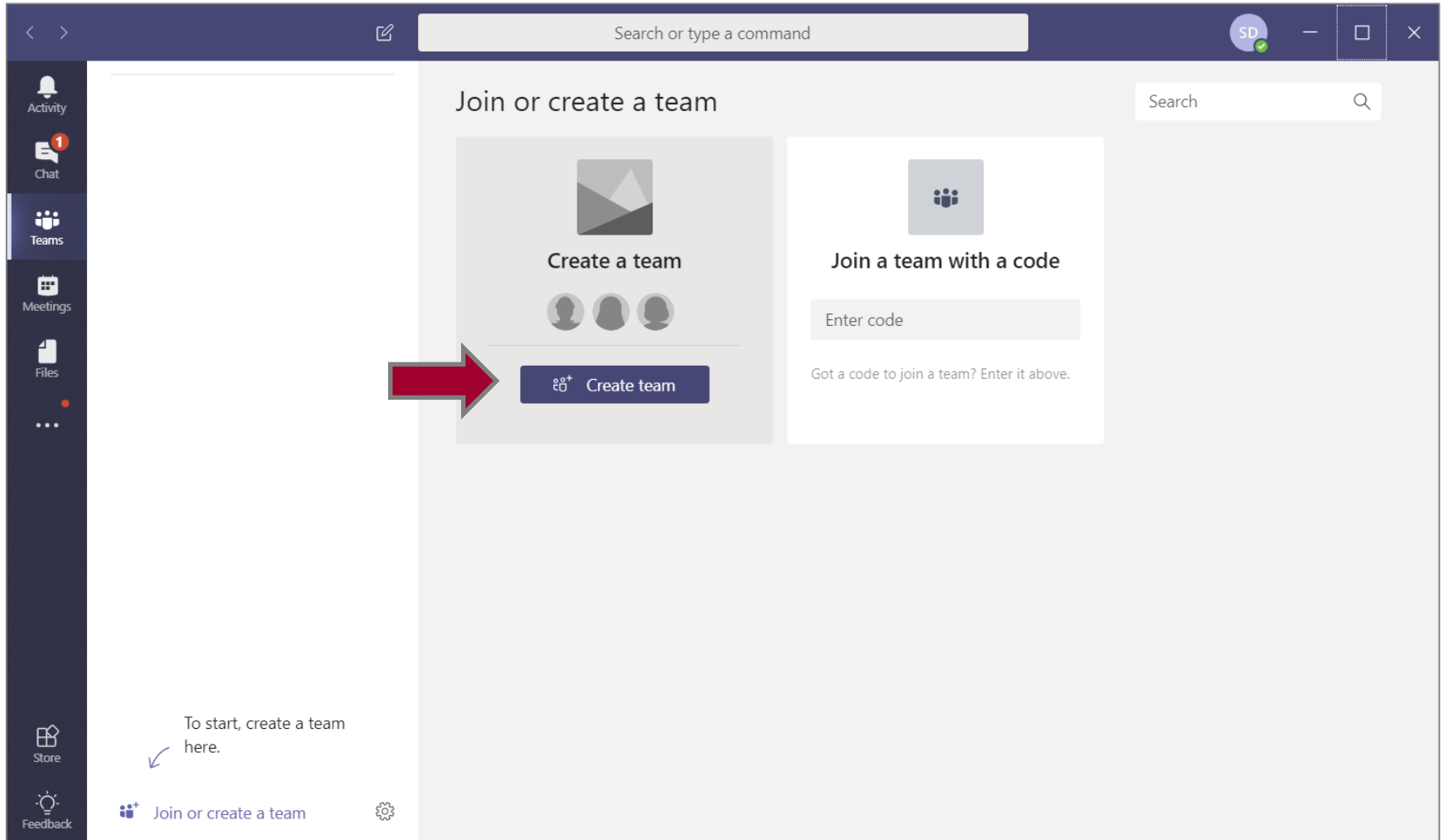


Introduction to Microsoft Teams

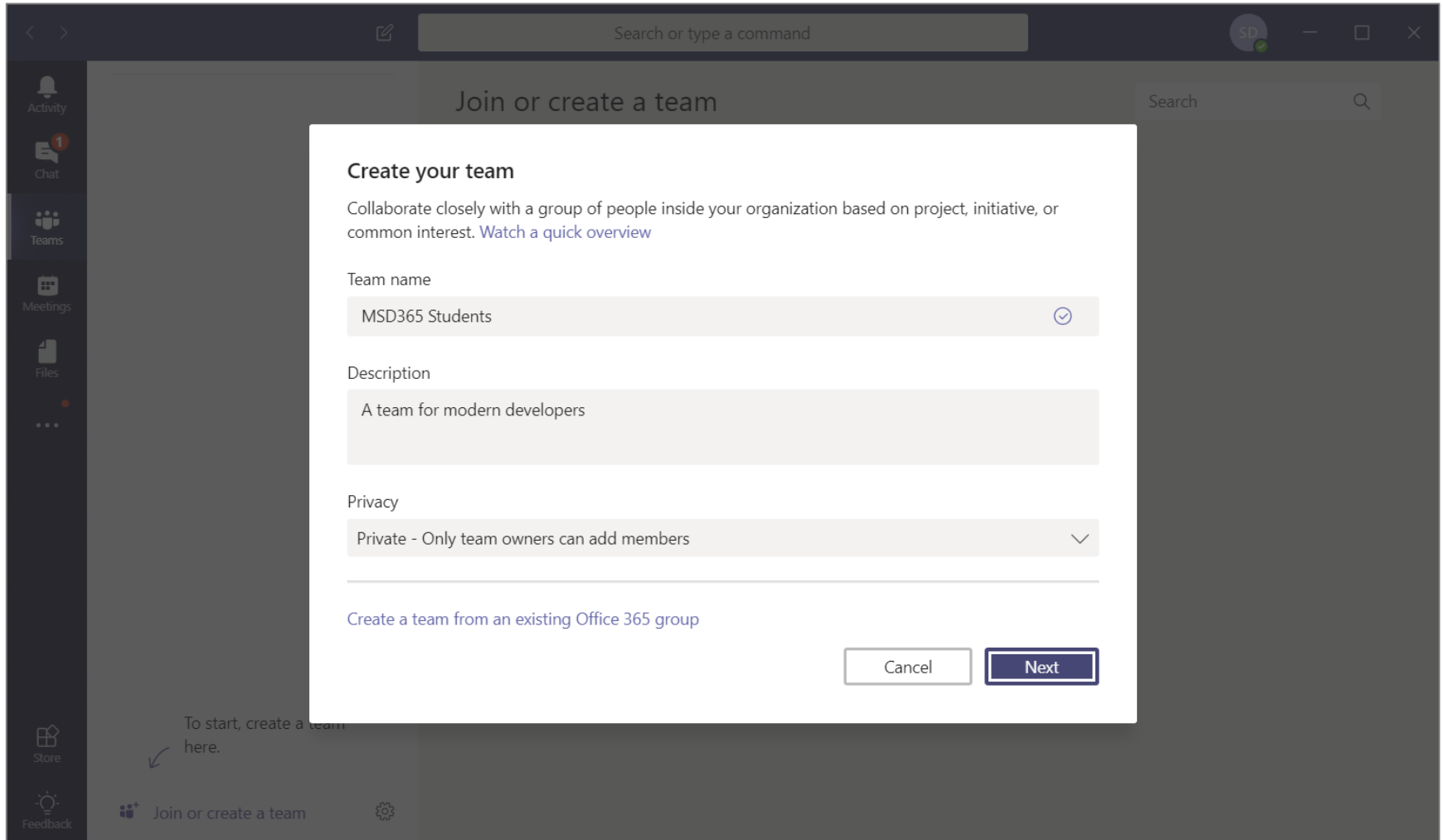
- Microsoft Teams is a Chat-based Workspace Service
 - Based on an evolved version of Skype for Business
 - Created by Microsoft to compete against Slack
 - Provides deep integration with Office 365
 - Offers native apps for Windows 10, Mac, iOS, Android and Windows Phone



Creating a New Team



Assign Team Name and Privacy Level



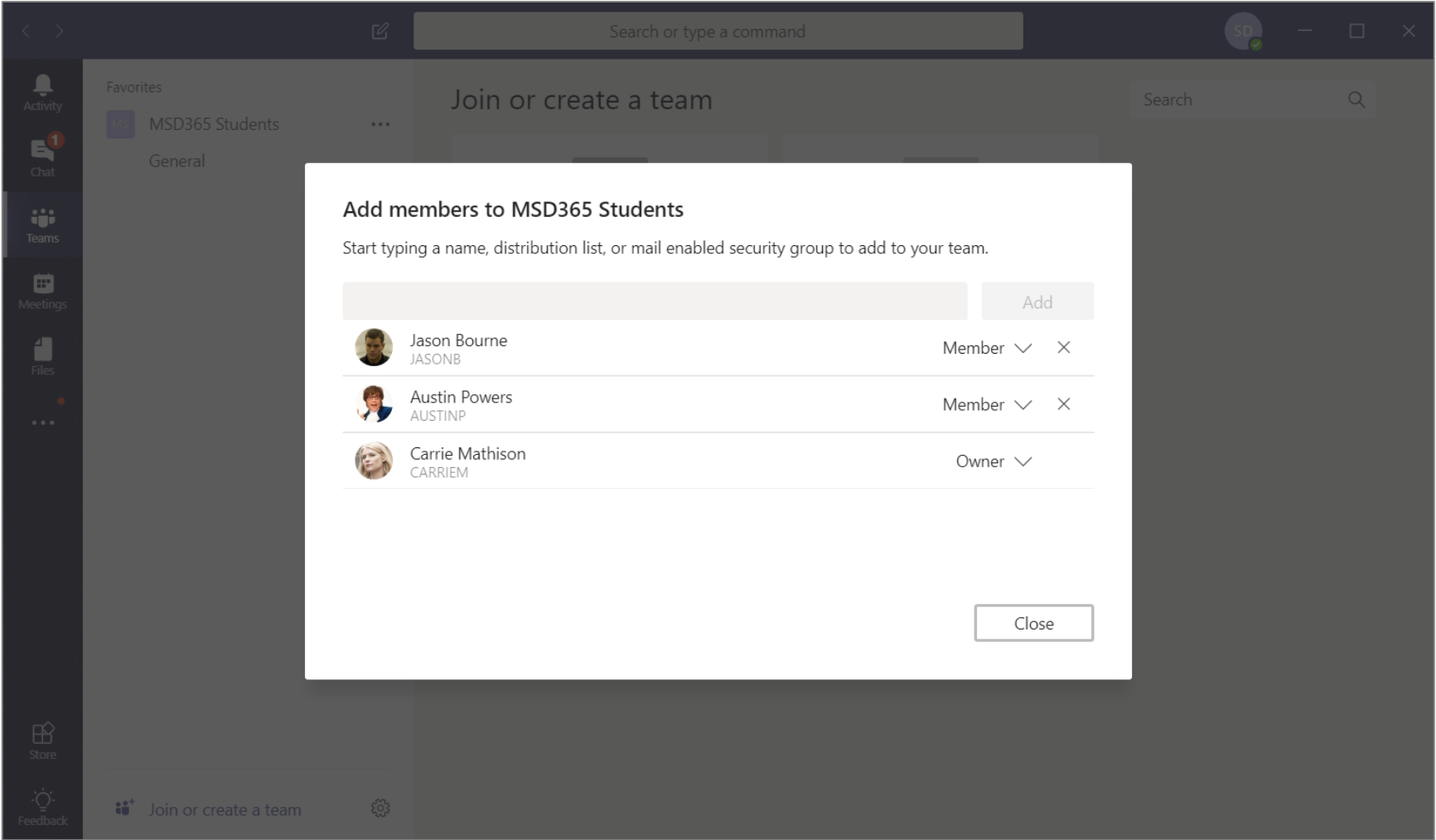
The screenshot shows the Microsoft Teams interface with a modal dialog titled "Join or create a team". The dialog is used for creating a new team. It includes a search bar at the top, a "Teams" icon in the left sidebar, and a "Join or create a team" button at the bottom. The dialog contains the following fields:

- Team name:** A text input field with the value "MSD365 Students" and a checkmark icon on the right.
- Description:** A text input field with the value "A team for modern developers".
- Privacy:** A dropdown menu with the selected option "Private - Only team owners can add members" and a downward arrow icon.

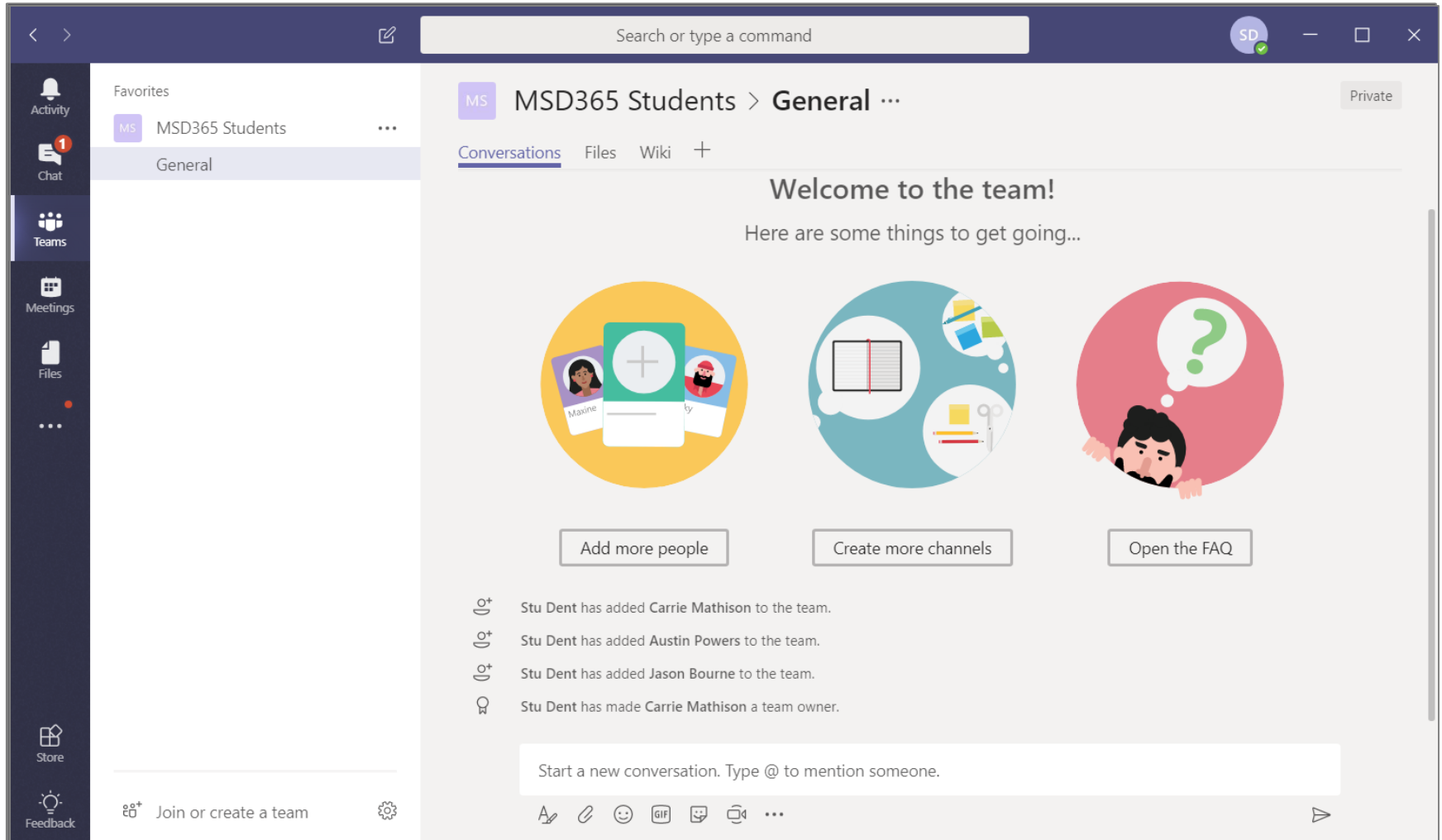
Below the fields, there is a link: "Create a team from an existing Office 365 group". At the bottom right of the dialog, there are two buttons: "Cancel" and "Next".



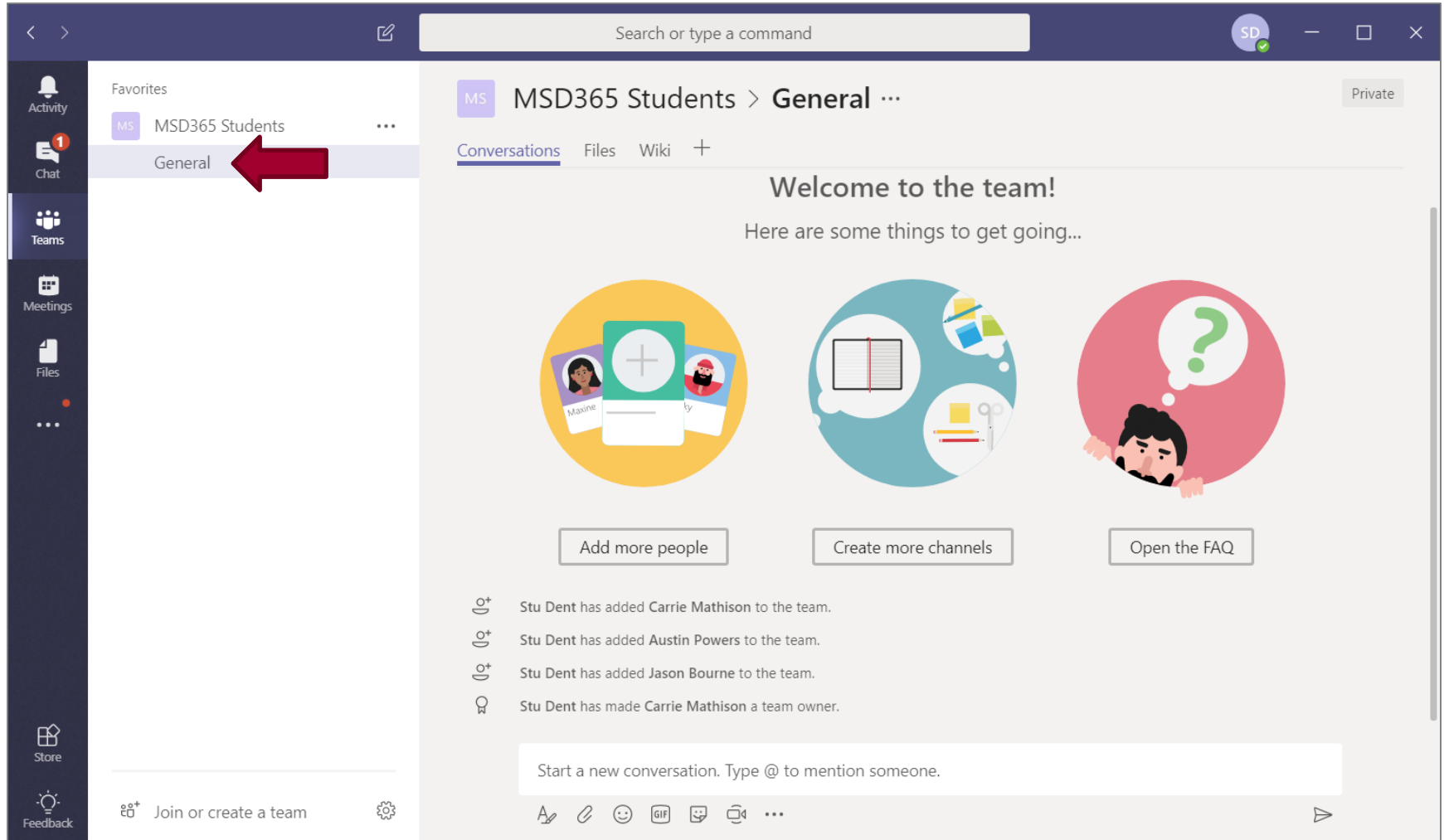
Add Team Members



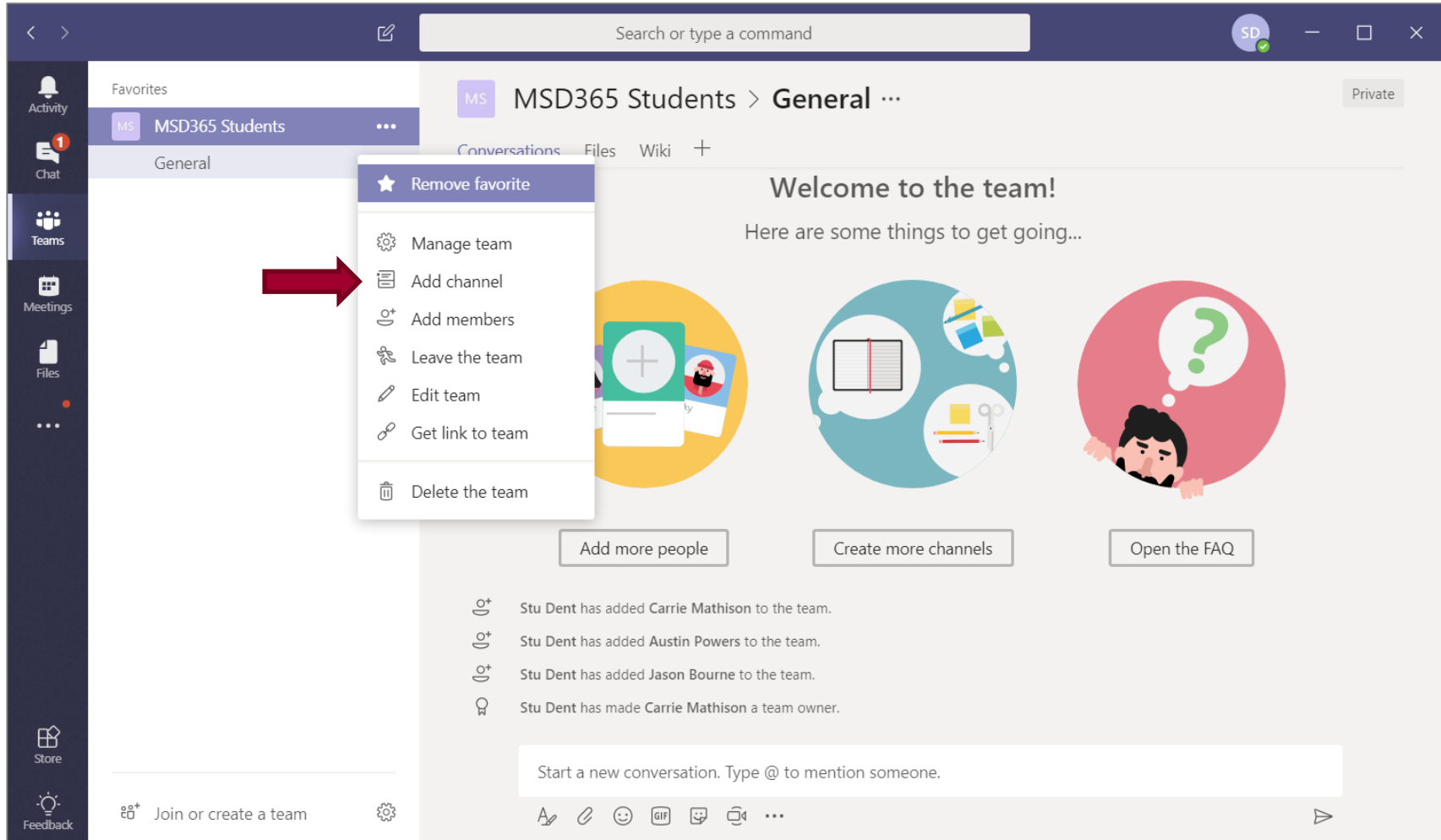
A Team is Born



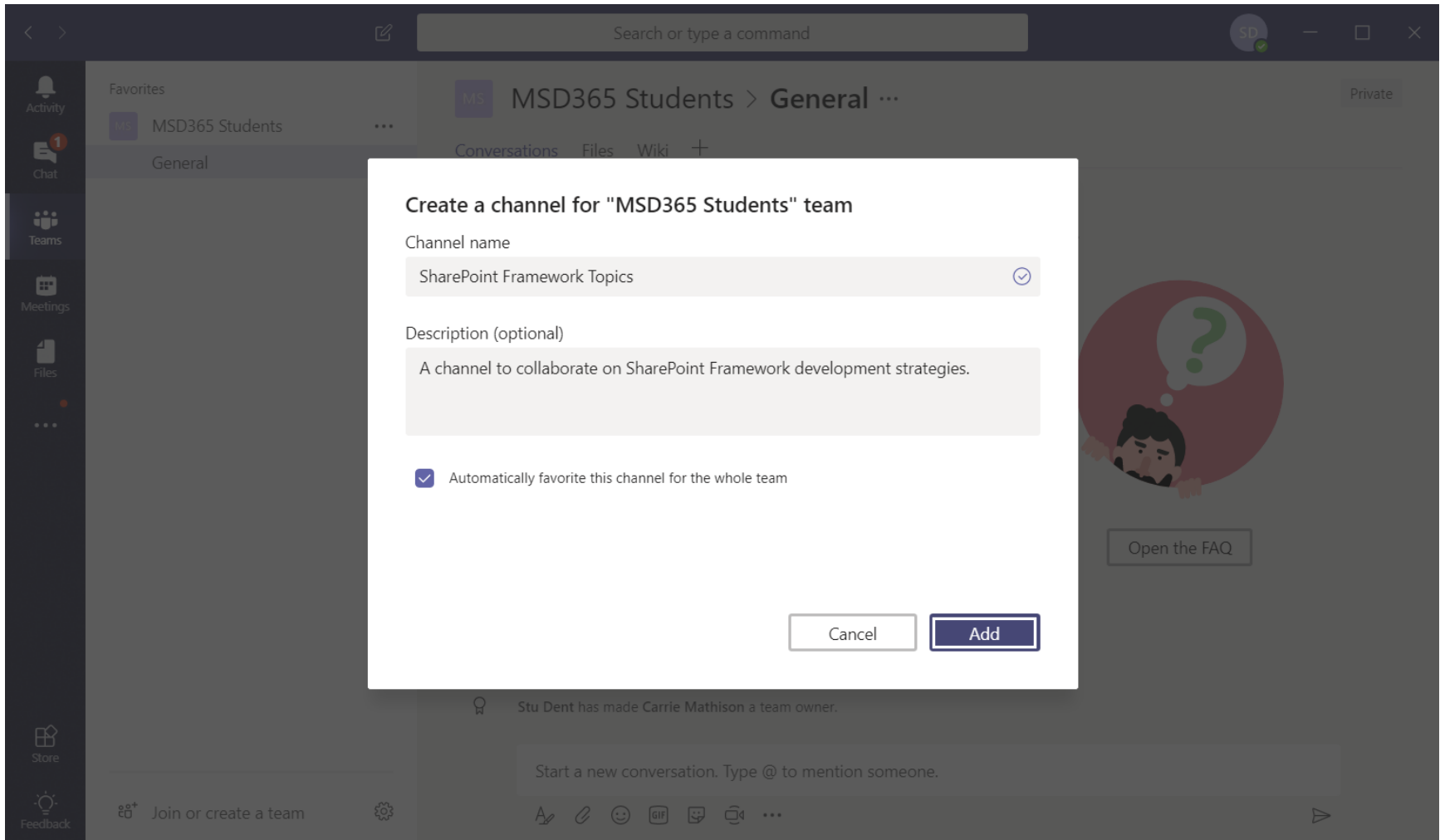
New Team has General Channel by Default



Add a New Channel

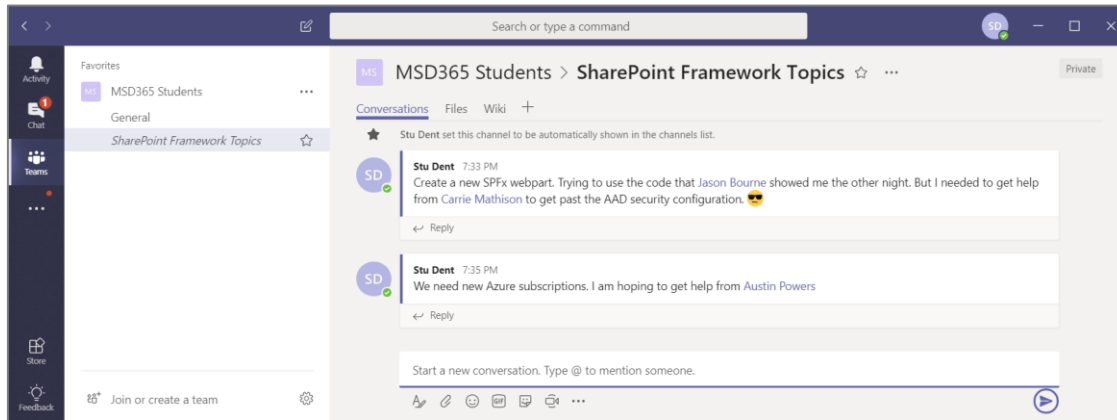


Creating a New Channel

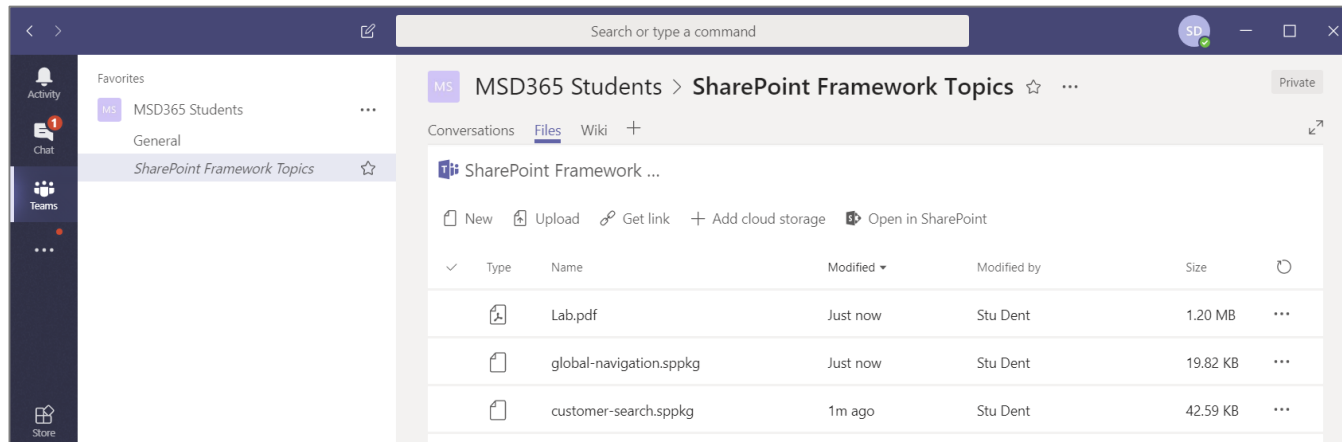


What's Inside a Channel?

- Threaded conversations



- Files collection (i.e. document library)



Adding Tabs

The screenshot shows the Microsoft Teams interface for the 'Northwind Traders' team, specifically the 'Development' channel. The left sidebar contains navigation icons for Activity, Chat, Teams, Meetings, Files, and Apps. The 'Teams' section is expanded, showing the 'Northwind Traders' team with channels for General, Customer Accounts, Development (selected), Marketing, Project Management, Website, and 32 more channels. Below this, there are sections for 'Contoso', 'Engineering', 'Fun stuff', and 'Marketing'. The main content area is titled 'Northwind Traders > Development' and includes tabs for Conversations, Files, Notes, Feature Backlog (selected), Deployments, and Pull Requests. A search bar is present at the top of the main content area. The 'Feature Backlog' tab displays three columns of tasks:

- Future Features:**
 - Add Customizer config for logo's background colour (1/3 progress, 1 comment, user avatar)
 - Sticker face tracking issue with Video Calls (1/3 progress, 1 comment, user avatar)
 - Add power by Edify Hub to login page when using someone else's branding (2/3 progress, 2 comments, user avatar)
 - Sermons page and widgets - sync with SermonAudio (1/3 progress, 1 comment, user avatar)
- Backlog:**
 - Add Customizer config for logo's background colour (4/4 progress, 4 comments, user avatar)
 - Zendesk SSO (2/3 progress, 2/3 completion, user avatar)
 - Admin notifications when info changes - with option to update info block (1/1 progress, 1 comment, user avatar)
 - Set up archive of logs. (1/3 progress, 1/3 completion, user avatar)
 - Upgrade OpenSSL (after Jul. 9) (1/3 progress, 1/3 completion, user avatar)
 - Add ability to force password reset (4/4 progress, 4 comments, user avatar)
 - Update login page to use new branding and styling (4/4 progress, 4 comments, user avatar)
- Required for Open Beta:**
 - Info.edifyhub.com, default to http instead of https. (2/2 progress, 2 comments, user avatar)
 - Support "mark inactive" (2/3 progress, 2/3 completion, user avatar)
 - Add keyboard shortcuts (1/1 progress, 1 comment, user avatar)
 - Test Accounts Server (1/1 progress, 1 comment, user avatar)
 - Want tips, usage examples, or API info? (2/2 progress, 2 comments, user avatar)
 - CMS-2345: Categorize more of the unknown locations (2/2 progress, 2 comments, user avatar)

Each task card includes a progress bar, a checklist, a comment count, and a user avatar. The interface also includes an 'Add a card...' button at the bottom of each column and an 'Add a list' button on the right side.

Microsoft Teams Development Platform

- Development features available today

 **Tabs** - surface rich content within Teams

 **Bots** - help users get tasks done in conversations

 **Connectors** - post rich updates to channels

- Development features in preview

 **Actionable Messages** - add rich interaction to connector cards

 **Activity Feed** - engage users via feed notifications

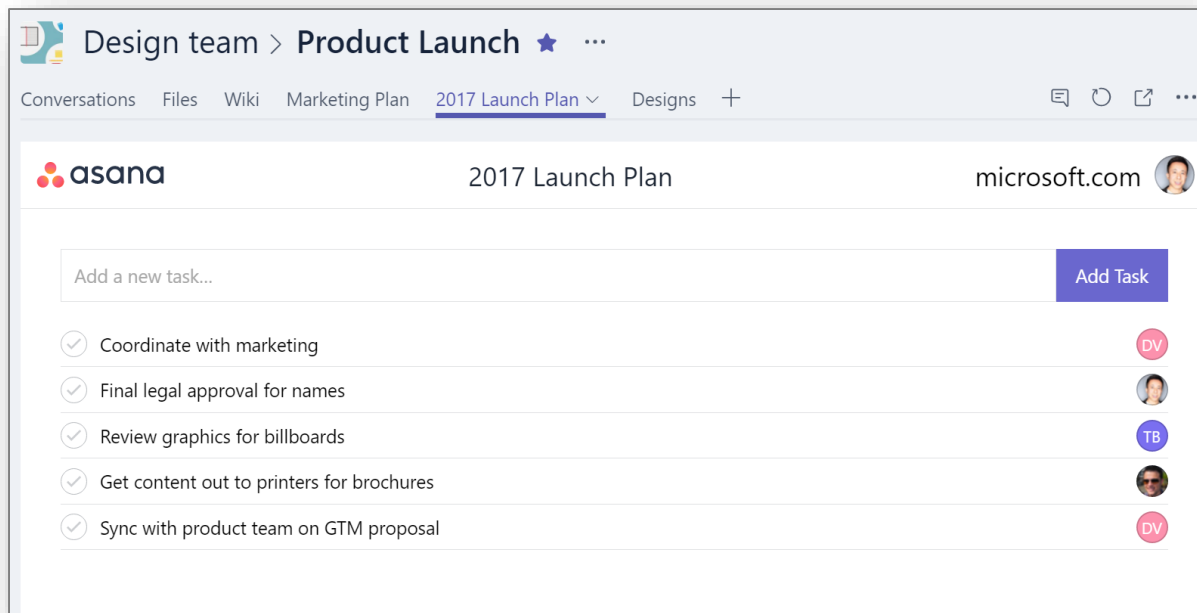
 **Compose Extensions** - users query & share cards in conversations

 **Office Store** - drive engagement by submitting app to Office Store



Developing Tabs

- Rich surface area for your app
- As simple as hosting your existing web app
- Team productivity: within channels
- Personal productivity: app flyout
- Your services, experience, & users



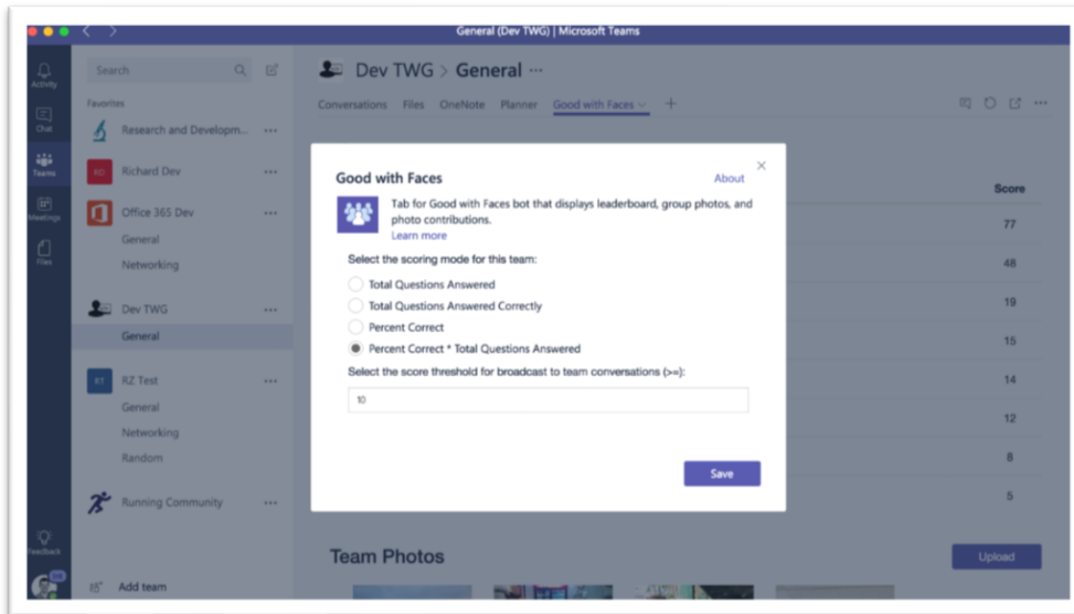
Tabs

- Embed-ready web UX on web/desktop, deep link to native apps on mobile
- Leverages Microsoft Teams Tab Library javascript for context and interactivity
- Team or Personal Scope



Tabs Pages

- Configuration Page
 - used to add/update tab and set content page
- Content Page
 - the primary page displayed in the tab
- Remove Page
 - optional page displayed when a tab is removed



Tabs - Config Page

- Used to Add or Edit a Tab
 - Must reference Microsoft Teams Tab Library
 - Sets the **contentUrl** for the tab
 - Calls **setSettings** to save tab configuration
 - Must call **setValidityState** to enable the save button
 - Call **notifySuccess** when saved

```
microsoftTeams.initialize();
microsoftTeams.settings.registerOnSaveHandler(function(saveEvent){
    microsoftTeams.settings.setSettings({
        entityId: "someid",
        contentUrl: "https://somedomain/tab.html",
        suggestedDisplayName: "Tab Title",
        websiteUrl: "https://somedomain/info.html",
        removeUrl: "https://somedomain/tabremove.html"
    });
    saveEvent.notifySuccess();
});

function onSaveClick() {
    microsoftTeams.settings.setValidityState(true);
}
```



Tabs - Context information

- getContext returns team/channel context:
 - tid – id of tenant
 - groupId – id of the O365 group
 - teamId – id of the team
 - channelId – id of the channel
 - entityId – id of the entity
 - theme – theme of the teams client
 - locale – the locale of the client
 - upn – UPN of the user

```
microsoftTeams.getContext(function (context) {  
    // context contains all context info  
});
```



Tabs - Deep linking to Entities

- Share a Link from your Tab
 - Trigger creation of deep link to specific Entity for user to copy and paste into a conversation
 - Resultant link may be clicked on by any user to launch the tab and navigate directly to that Entity
 - Programmatically create your own link, for use via bot or other code flows

```
microsoftTeams.shareDeepLink({  
  subEntityId: <subEntityId>,  
  subEntityLabel: <subEntityLabel>,  
  subEntityWebUrl: <subEntityWebUrl>  
})
```

```
https://teams.microsoft.com/l/entity/<appId>/<entityId>?webUrl=<entityWebUrl>&  
label=<entityLabel>&  
context=<context>
```



Activity

6

Chat

1

Teams

3

Meetings

1

Files

1

Apps

1

Feedback

1

Profile

1

Microsoft Teams

Search

Search

Northwind Traders

General

Customer Accounts

Development

Marketing

Project Management

Website

32 more channels

Contoso

Engineering

General

Fun stuff

Marketing

Weekly Specials

4 more channels

More

Add team

Northwind Traders > Development

Conversations Files Notes Feature Backlog Deployments Pull Requests +

Find

Future Features Backlog Required for Open Beta Add a list

Test bug

in list Project Tasks

Labels

mobile ios +

Edit the description...

Write a comment

send

Activity

Will Little added this card to Project Tasks Jan 31 at 1:08 pm

Add

Members

Labels

Checklist

Due Date

Attachment

Power-Ups

Github

Actions

Move

Copy

Subscribe

Archive

Add a card...

Add a card...

Add a card...



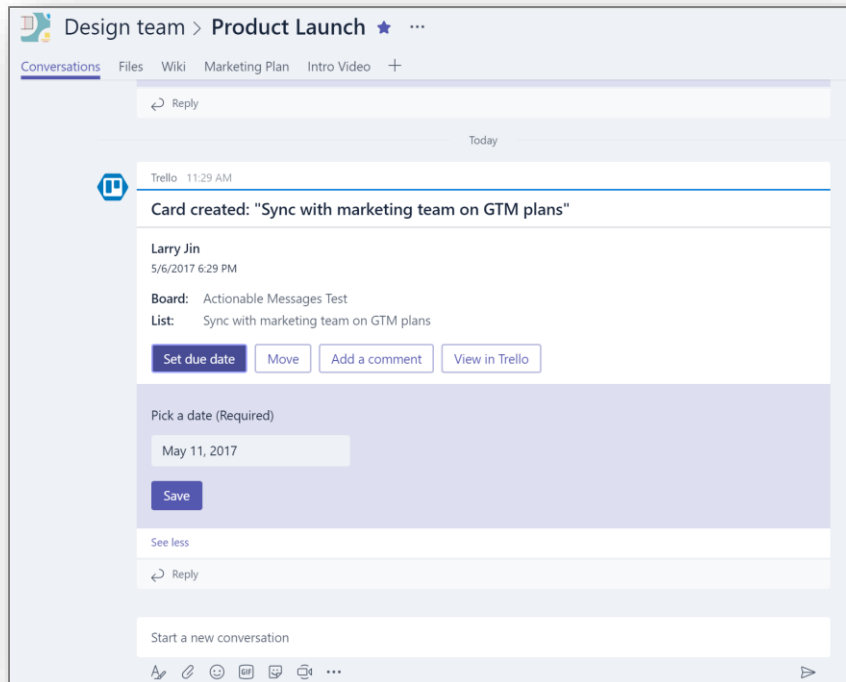
Building a Great Tabs experience

- Configurable Tabs
 - In channel, tabs allow user to configure view to relevant content
 - Content should be the same for all users – leverage collaboration
 - Content should be locked – don't allow users to browse away
- Static Tabs
 - In personal scope, this content should be the relevant for either the all-up app (e.g. Help, FAQ, forums) or for a personal view of the experience



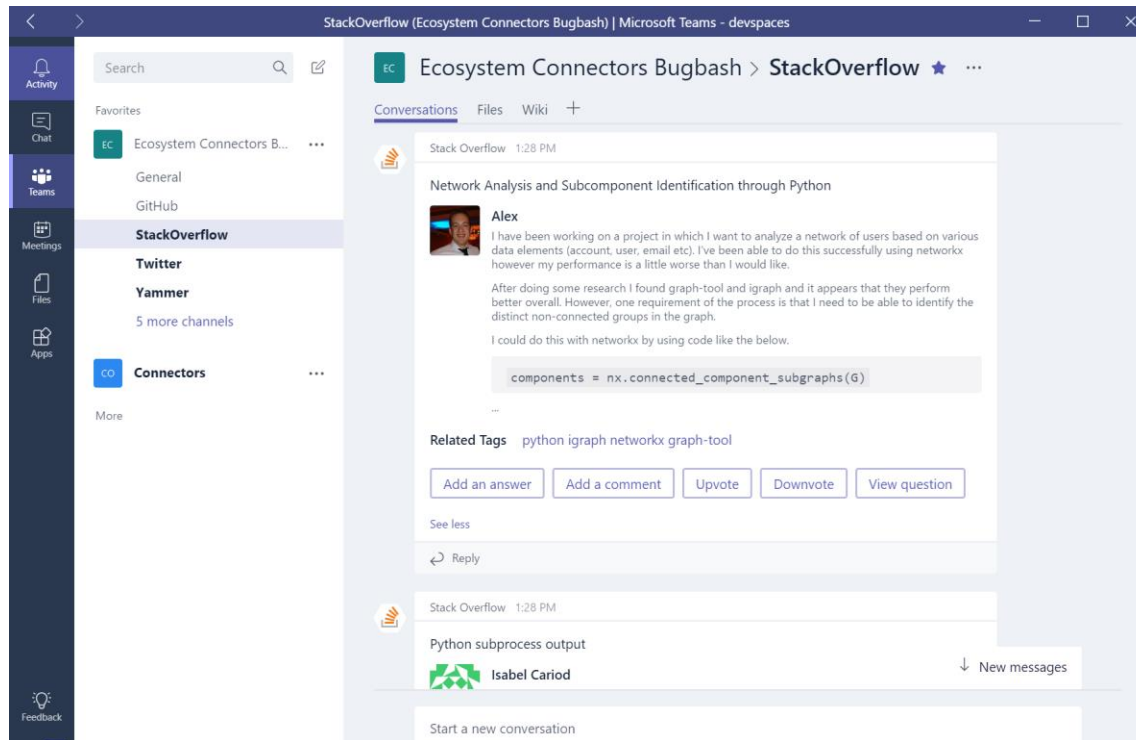
Connectors with Actionable Messages

- Push rich interactive cards into channels
- Fully supported in both Teams and Outlook
- Users can take quick actions (e.g. comment or set a date)
- Uses incoming webhook API



Office 365 Connectors

- Leverage webhooks to send activity into Teams
 - Build connector, registering on the Connector Developer Portal
 - Simply add Connector ID to manifest.json
 - Leverage Actionable Messages to allow inline work commands



6

Activity

Chat

Teams

Meetings

Files

Apps

Feedback

Microsoft Teams

Search

Feed

DF

Daichi Fukuda

Posted a new reply on your file.

NewDesign-Proposal.pptx

1m ago

MB

Marie Beaudouin

Replied to you in Website

Yes, but not all the concerns have been addressed.

25m ago

Contoso

Cassandra Dunn assigned you to a task

CMS-2346: Categorize more of the unknown locations

30m ago

Babek Shammass

Mentioned you in Marketing

I can get on board with that. Thanks for taking a look! Would you mind...

2h ago

Contoso

Daichi Fukuda sent you a pull request.

Your response is required

3h ago

Will Little

Invited you to attend

11:30am 1 hour

Social Calendar Client Review

Accept

Decline

4h ago

IA

Ivan Averyanov

Reacted to your reply in Website

Northwind Traders > Development

Conversations Files Notes Feature Backlog Deployments Pull Requests

Find

Future Features Backlog Required for Open Beta Add a list

CMS 2346: Categorize more of the unknown locations

in list Project Tasks

Labels

mobile ios +

Edit the description...

Write a comment

send

Activity

Cassandra Dunn assigned you to the task 2/24 at 1:00 pm

Babek Shammass created the task 2/3 at 10:32 am

Add

Members

Labels

Checklist

Due Date

Attachment

Power-Ups

Github

Actions

Move

Copy

Subscribe

Archive

Add a card...

Add a card...

Add a card...



Activity 6

Chat

Teams

Meetings

Files

Apps

Feedback

Search

Feed

Daichi Fukuda
Posted a new reply on your file.
NewDesign-Proposal.pptx
1m ago

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4h ago

Ivan Averyanov
Reacted to your reply in Website

Northwind Traders > Development

Conversations Files Notes Feature Backlog Deployments Pull Requests

App v 5.6 / Northwind Traders

Pull requests

Filter by: Open Author Target branch I'm reviewing

Summary Reviewers Builds

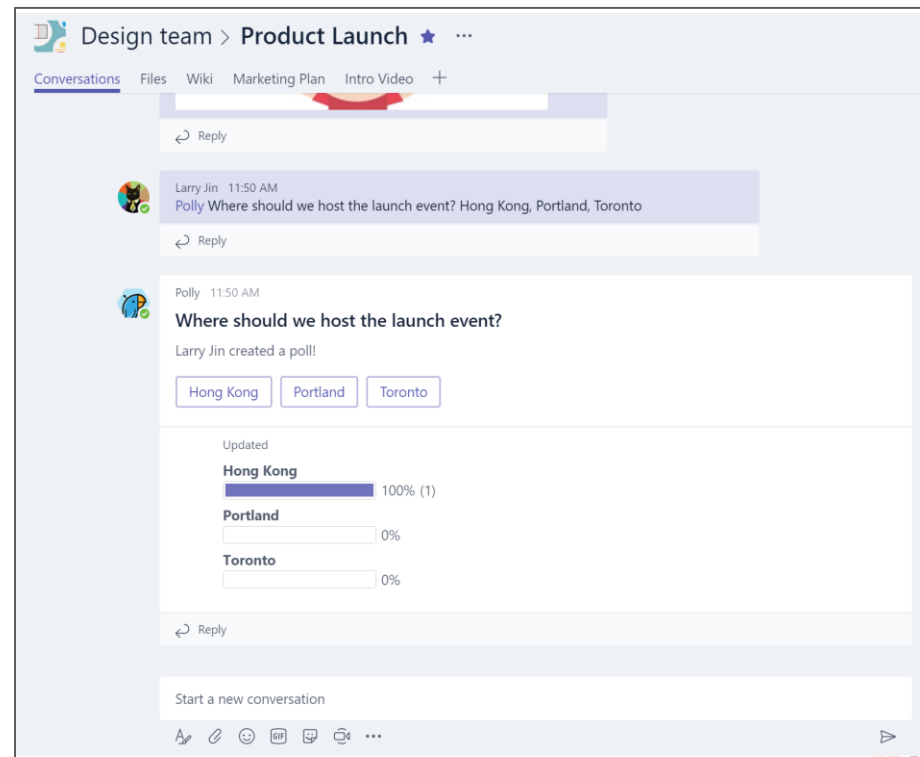
Bugfix/CMS-8876B cart is crashing → master
Daichi Fukuda, last updated February 23 2017

Bugfix/CMS-5468C refresh issues → master
Daichi Fukuda, last updated February 22 2017

Bugfix/CMS-4453 Color picker for widget selector changes → master
Daichi Fukuda, last updated February 20 2017

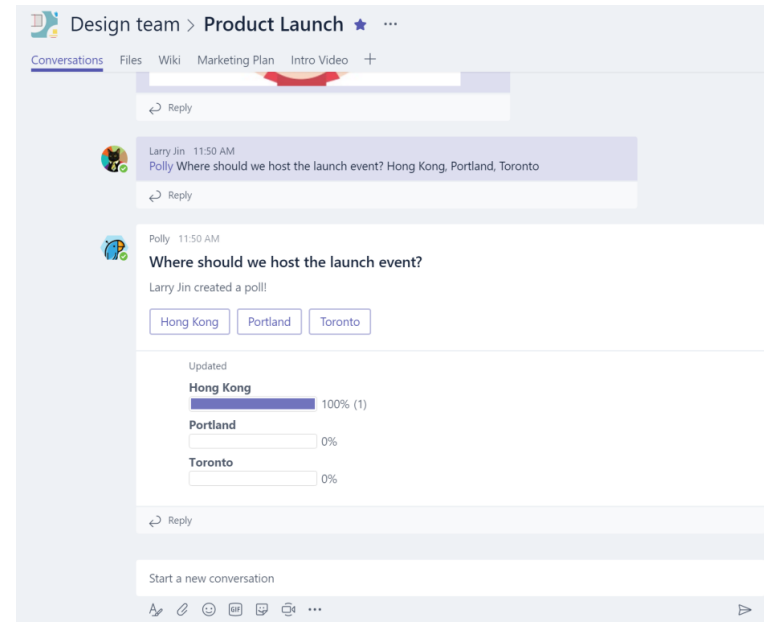
Bots

- Bot is app with automated interaction in Team with conversations or 1:1
- Built using Microsoft Bot Framework
- Complete tasks via basic commands, menu or natural language
- Rich Microsoft Teams features, e.g.
 - Input menus
 - Dynamic message updates
 - Integrate with tabs



Bots

- Based on Web Service you create and host
 - Use whatever web technology you prefer
 - Extra support for using Node.js or .NET on Azure
- Built using Microsoft Bot Framework
 - Call REST APIs directly or use libraries for Node.js and .NET
 - New Microsoft Teams Extension libraries (Node.js and .NET) provide channel-specific functionality



Bots – Getting up and running

- Set up basic development environment
 - Install Bot Builder
 - Install Microsoft Teams extension SDKs for chosen language
- Leverage existing samples
 - Bot Framework sample
 - Teams Getting Started sample
- Run locally to test in the Bot Emulator



Bots - Getting Teams-ready

- Register your bot in the Bot Framework Dev Portal
 - Set a unique bot name and handle
 - Set your bot Endpoint – your hosted domain, or your debug instance (we recommend Ngrok)
 - Create an AppID (aka BotID) and Password
 - Add Microsoft Teams as a Channel
 - Note: for 1:1 bot, you may reference your bot directly via its AppID
 - Enter your AppID and Password into your Development environment
 - Build and publish or run locally with Ngrok



Bots - Accessing in Teams

- Create a Teams App Manifest
 - Microsoft provides SimpleBot package
 - SimpleBot has manifest with sample icons
 - Add your BotID in the Bots object
 - Sideload into a Team

```
{
  "manifestVersion": "1.0",
  "version": "1.0.0",
  "id": "%APP_GUID%",
  "packageName": "com.samples.samplebot",
  "developer": {
    "name": "Microsoft",
    "websiteUrl": "https://www.microsoft.com",
    "privacyUrl": "https://www.microsoft.com/privacy",
    "termsOfUseUrl": "https://www.microsoft.com/termsofuse"
  },
  "name": {
    "short": "Sample Bot App"
  },
  "description": {
    "short": "This is a sample bot manifest",
    "full": "This sample bot manifest has minimum info."
  },
  "icons": {
    "outline": "contoso20x20.png",
    "color": "contoso96x96.png"
  },
  "accentColor": "#60A18E",
  "bots": [
    {
      "botId": "%BOT_FRAMEWORK_ID%",
      "scopes": [
        "team",
        "personal"
      ]
    }
  ],
  "permissions": [
    "identity",
    "messageTeamMembers"
  ]
}
```



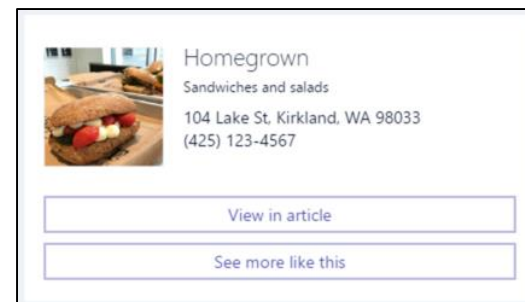
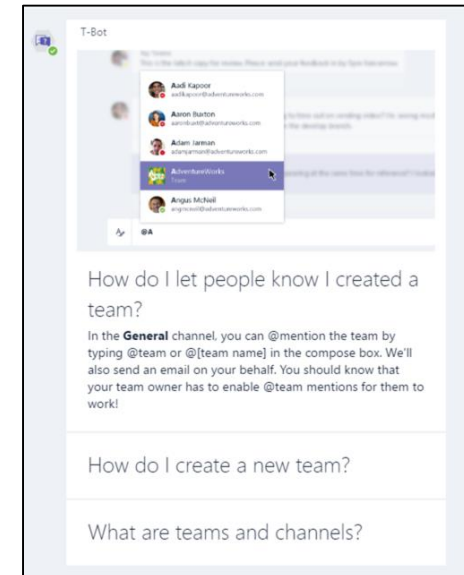
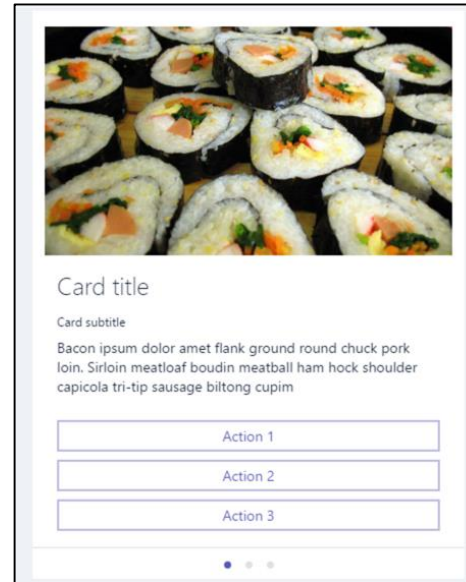
Bot - Messaging

- Responsive messages (via 1:1 or @mentioning in channel)
 - Proactively create messages
 - Create direct (1:1) message – must know user ID
 - Create new channel reply – bot must be added to team and know channel information
- Update messages sent by Bot
 - One-way only – e.g. push notifications



Bot - Content

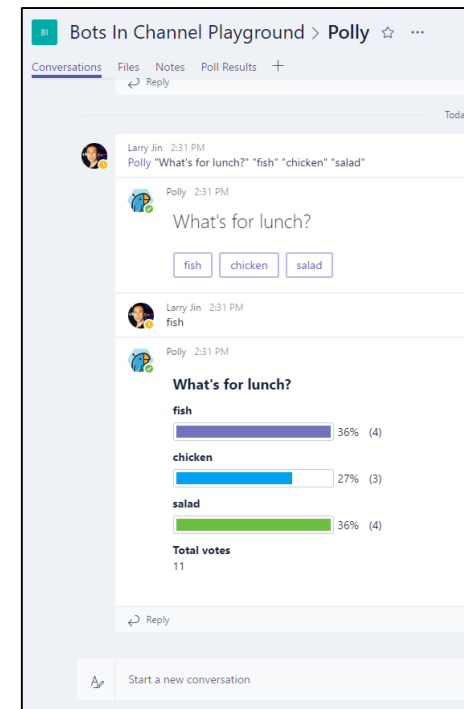
- User to bot
 - Plain or rich text
 - Inline images
 - Note: files not currently supported
- Bot to user
 - Plain text
 - Markdown or XML
 - Cards
 - Hero Cards
 - Thumbnails
 - Sign-in
 - Carousel or List layouts
 - Buttons
 - openUrl – open in browser
 - imBack – trigger chat response
 - invoke – silent JSON payload



Bots in Team Channels - Basics

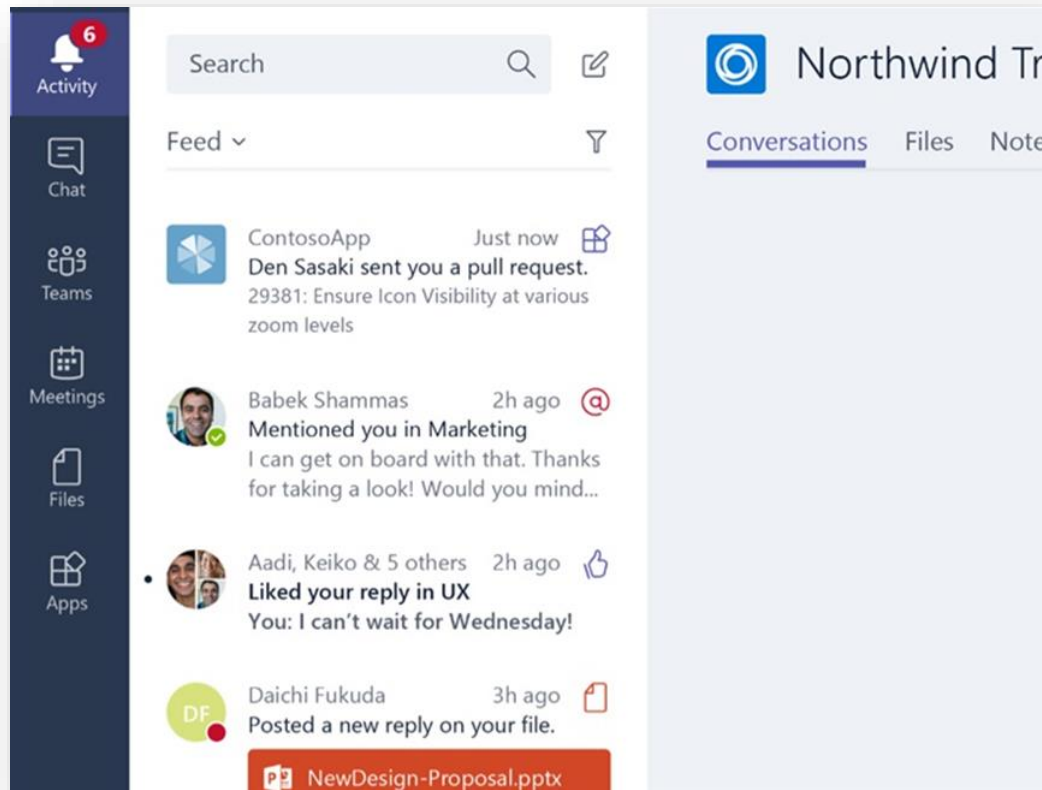
- Bot only listens to @mentions
 - Replies go to the conversation thread
 - Inbound payload in channels is flagged as isGroup and contains Teams channel data:

```
"channelData": {  
  "channel": {  
    "id": "19:293ecdb923ac4458a5c23661b505fc84@thread.skype",  
  },  
  "team": {  
    "id": "19:293ecdb923ac4458a5c23661b505fc84@thread.skype"  
  },  
  "tenant": {  
    "id": "72f988bf-86f1-41af-91ab-2d7cd011db47"  
  }  
}
```



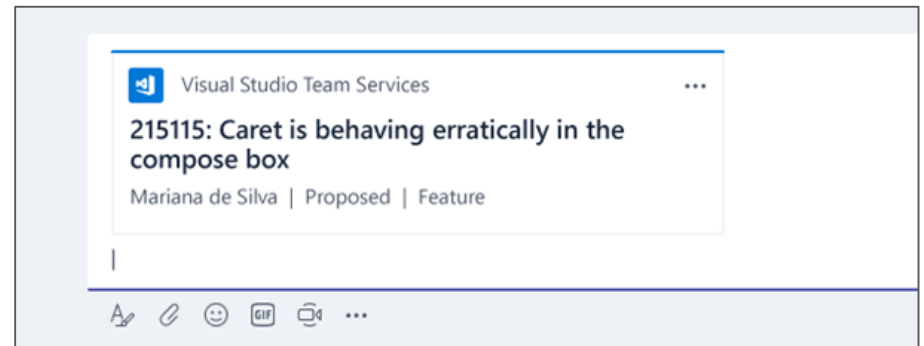
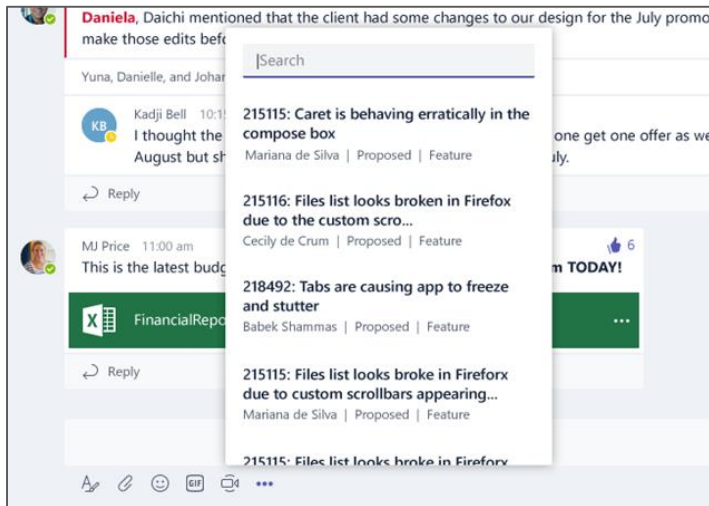
Activity Feed

- Notify users personally via the activity feed
- Same API as sending bot messages
- Deep link straight into tabs



Compose Extensions

- Personalize Teams Compose box with your App & Services content
- Users can query and insert your app content into conversations
- Example: Bug details from VSTS
- Example: Sales opportunities from CRM
- You can reuse services you built for Bots or Tabs



Microsoft Teams App

- Microsoft Teams Apps
 - Deliver custom solution using solution package (.zip)
 - Single App definition – manifest.json
 - Single package used for Sideloading or Office Store



Building a Great Microsoft Teams app

- Teams Scope - your experience exists in the team context
 - Team owners may add your experience to a team:
 - Bots and Compose Extensions – available on all channels
 - Teams Tabs (“Configurable”) – added and customized on a per-channel basis
- Personal Scope – your experience exists in individual user context
 - Individuals add the experiences they want for personal use
 - Bots and Compose Extensions – available in 1:1 chat
 - Personal Tabs (“Static”) – available to end users via the App bar or alongside 1:1 bots



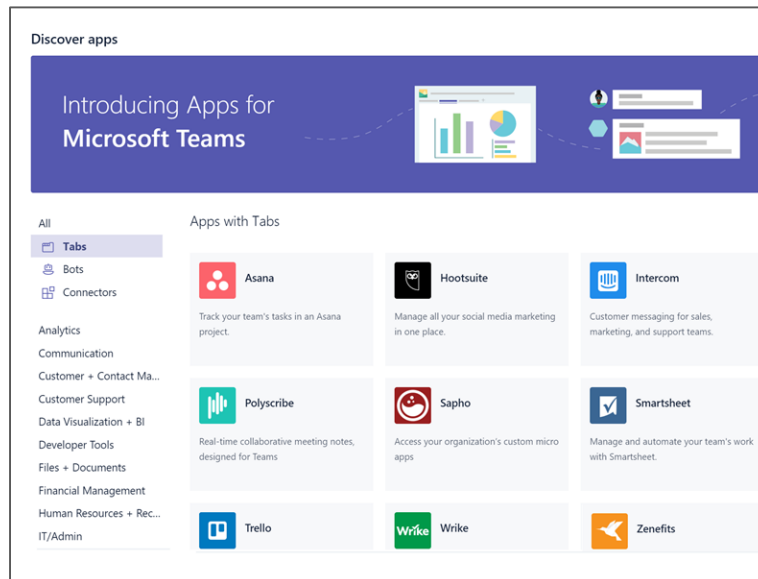
Getting Started

- Tabs - Bring your own Service
 - JavaScript APIs to tie your experience to Teams context
- Connectors – Leverage the Connectors Developer Portal
 - Use new Actionable Cards layouts that work in Outlook and Teams
- Bots – Build using the Bot Framework
 - Use the .NET and Node.js SDKs, or call the REST endpoints
 - Teams Extension SDKs provide Teams-specific functionality
 - Flag important messages for inclusion in Activity Feed
- Compose Extensions – Reuse your bot
 - Use the .NET and Node.js SDKs, or call the REST endpoints
 - Teams Extension SDKs provide Teams-specific functionality



Deploying

- ISVs – Distribute through the Office Store
 - Create or use your existing DevCenter/Seller Dashboard account
 - Upload your package and enter your product page metadata
 - Office Store Validation ensure compliance with Office Store Policy
 - Validated apps published to Office Store appear in Microsoft Teams Discovery view
- Line-of-Business apps – Sideload your package
 - Leverage the same testing methodology to deploy within your org



Compose Extensions

- Service that listens to user requests and returns cards or rich media
 - Leverage the Bot you've already built, or build another
 - Define commands and parameters in the manifest.json
 - Handle via Bot Framework activity, leveraging the Microsoft Bot Extension SDKs

```
"composeExtensions": [  
  {  
    "botId": "57a3c29f-1fc5-4d97-a142-35bb662b7b23",  
    "scopes": [  
      "personal"  
    ],  
    "commands": [{  
      "id": "searchCmd",  
      "description": "Search Bing for information on the web",  
      "title": "Search",  
      "initialRun": "true",  
      "parameters": [{  
        "name": "searchKeyword",  
        "description": "Enter your search keywords",  
        "title": "Keywords"  
      }]  
    }  
  ]  
},  
],
```



Building a Compose Extension Experience

- Compose Extensions in Microsoft Teams
 - Share content that makes sense in conversations.
 - Add on as part of core Bot offering to facilitate easier management.
 - Take advantage of the rich card types provided as part of the platform.
 - Optimize search results to keep compose extensions snappy and responsive.



6

Activity

Chat

Teams

Meetings

Files

Apps

Feedback

Microsoft Teams

Search

Favorites

Northwind Traders

...

General

Customer Accounts

Development

Marketing

Project Management

Website

32 more channels

Contoso

...

Engineering

...

General

Fun stuff

Marketing

Weekly Specials

4 more channels

More

Add team

Northwind Traders > Development

★ ...

Conversations

Files

Notes

Feature Backlog

Deployments

Pull Requests

+

Page refresh is taking too long to load.

IT Service Desk | 764CVC

Details

Type: Fault

Priority: Major

Components: Extranet

Labels: None

Status: In Progress

Issue Links

Relates to: 762CHJ Scroll performance

Show full summary

Contoso 12:30 pm

The following item was marked as closed. Shiproom

Company Extranet fails to load documents section

IT Service Desk | 884CVC

Details

Type: Fault

Priority: Major

Components: Extranet

Labels: None

Status: Closed

Issue Links

Relates to: 884CVB Users can't locate files

Show full summary

Start a new conversation

Activity Feed

- Use the Activity Feed to send important information to your users
- Leverage existing Bot to tag specific messages as notification alerts
- Encode deep link to entity (tab) for one-click navigation to content

