Deploy and manage Microsoft Teams

Get Microsoft Teams up and running.
Recap of Previous Presentations

Introduction to Teams at https://aka.ms/microsoft-teams-readiness
Agenda

• Foundation of Microsoft Teams
• Infrastructure Guidance
• Network Planning
• The Admin Portal
• Client Rollout
• Chat Services
Goals of this Training

- How Microsoft Teams leverages existing Office 365 products
- Ensure Microsoft Teams is able to communicate to the cloud services from within your organization
- Enable and manage the settings
- Rollout the client
- Understand the Meeting and Chat services
Foundation of Microsoft Teams
Foundation of Microsoft Teams

- Microsoft Teams is built on top of Existing Microsoft Technologies:
  - Office 365 Groups
  - Office 365 Azure Active Directory
  - Exchange
  - SharePoint
  - OneNote
Office 365 Groups

• Microsoft Teams uses group membership as the access control list to Files and Notes tabs
• Owners of existing Groups can move them over to Microsoft Teams
• Team creation settings are controlled through the admin portal where you control group creation settings.
Azure Active Directory (AAD)

- Microsoft Teams uses your existing O365 Azure Active Directory credentials to sign in
- Your Identities are stored in Azure Active Directory
- Can leverage Azure Active Directory Modern Authentication for enhanced security
Exchange

• A group mailbox and calendar gets created for the Team
• Meetings created within Microsoft Teams gets pushed to your Exchange calendar
• Meetings created in Exchange get synced to Microsoft Teams
SharePoint

• Microsoft Teams create a SharePoint site for each Team
• Each Channel within a Team will get a folder on this SharePoint site
• Files shared within the Team are stored on SharePoint
OneDrive for Business

- Files that are shared during private chats are hosted on the user’s OneDrive for Business storage
- Navigating to the Files icon on the left side of the application gives you instant access to your OneDrive for Business files
OneNote

• Notebooks are created for each Team
• Shared Notebook is hosted on SharePoint site
• Sections are created for each Channel
• Accessible from OneNote applications
Infrastructure Guidance for Microsoft Teams
Service Endpoint Whitelisting

• Customers are required to whitelist specific URLs on their proxies/firewalls.

• For a current list of endpoints refer here: [Office 365 URLs and IP address ranges](#)
## Whitelisted Endpoints

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Source</th>
<th>Credentials</th>
<th>Destination</th>
<th>Destination Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Teams web access</td>
<td>Client computer</td>
<td>Logged on user</td>
<td>*.teams.microsoft.com</td>
<td>TCP 443</td>
</tr>
<tr>
<td>Email notification service</td>
<td>Client computer</td>
<td>Logged on user</td>
<td>emails.teams.skype.com</td>
<td>TCP 443</td>
</tr>
<tr>
<td>Calling Media Relay Services</td>
<td>Client computer</td>
<td>Logged on user</td>
<td>13.107.8.0/24</td>
<td>TCP 443; UDP 3478-3481</td>
</tr>
<tr>
<td>Chat service</td>
<td>Client computer</td>
<td>Logged on user</td>
<td>*msg.skype.com</td>
<td>TCP 443</td>
</tr>
<tr>
<td>1:1 Calling</td>
<td>Client computer</td>
<td>Logged on user</td>
<td>*cc.skype.com</td>
<td>TCP 443</td>
</tr>
<tr>
<td>Azure media services</td>
<td>Client computer</td>
<td>Logged on user</td>
<td>*asm.skype.com</td>
<td>TCP 443</td>
</tr>
<tr>
<td>Global traffic manager</td>
<td>Client computer</td>
<td>Logged on user</td>
<td>s-0001.s-msedge.net</td>
<td>TCP 443</td>
</tr>
<tr>
<td>Global traffic manager</td>
<td>Client computer</td>
<td>Logged on user</td>
<td>s-0002.s-msedge.net</td>
<td>TCP 443</td>
</tr>
<tr>
<td>Global configuration manager</td>
<td>Client computer</td>
<td>Logged on user</td>
<td>*.config.skype.com</td>
<td>TCP 443</td>
</tr>
</tbody>
</table>

For the complete list visit: [URLs and IP address ranges](#)
Network planning
Chat service versus real-time media

• Chat Service
  • Messaging (in Teams and Private Chat)
    • Chat
    • GIFs, memes, emojis
  • Files

• Real-time media
  • Audio
  • Video
  • Desktop sharing

Microsoft Teams
Understanding client flows

• Chat Service content will always travel via O365
• In a 1:1 call, Audio, Video and/or Desktop Sharing will go direct
  • Peer-to-peer if network allows
  • Can be proxied via O365 if required
• Meetings will go via O365
  • For Meetings O365 receives all incoming media and sends it out to the all participants
Conferencing flows

- Audio
  - Each participant sends one audio stream
  - Conferencing Unit in O365 mixes audio streams
  - Sends exactly one audio stream to each participant
Conferencing flows (Continued)

- Video
  - Each participant sends video
  - Each participant can receive up to four video streams
  - When more than four participants, the most recent four speakers will be shown

Microsoft Teams
Conferencing flows (Continued)

• Desktop Sharing
  • Leverages a video stream
  • One user sends, all other users receive
  • Stream based on receiver capability
Call Flows – 1:1 Call Direct

Chat Service users Port 443 TCP (see long list of FQDNs)

Direct media connection

Microsoft Teams
Call Flows – 1:1 Call Firewalled

O365 functions as a relay for the media traffic, if direct connections are not possible.

Media ports from the participant to O365 use: UDP 3478, 3479, 3480, 3481 TCP 443

Microsoft Teams
Call Flows – Multi-Party

In “Meetings”, audio gets mixed in O365 and sent out to all participants. Video and desktop sharing is also sent to O365 and distributed from there.
UDP vs. TCP

TCP
• Requires each packet to be acknowledged by the receiver
• Lost packets are resent, causing subsequent packets to be delayed

UDP
• “Fire and forget”, what is lost is lost
Real Time Communication

• Teams can use TCP or UDP
• For real time communication, we want packets quickly
• If we lose (some) packets, we do not really care: audio and video might experience glitches, but session continues

Microsoft Teams
Networking best practices

• Allow UDP traffic for better quality
  • UDP 3478, 3479, 3480, 3481

• Make sure UDP traffic is not blocked by
  • Routers must be configured to allow Microsoft Teams traffic to travel directly to Office 365
  • Proxies should always be bypassed

Microsoft Teams
Using Proxies will Impact Quality

- Media might be forced over TCP instead of UDP
- Connection issues to Office 365 might occur
- Quality will be impacted in all cases
Wireless

• Real-time communication is different (and difficult)
  • Packet loss, jitter and latency
  • Streaming HD Videos isn’t the same as HD Video Calling

• Access Point coverage
  • Over vs Under provisioned
  • Work with your networking team

Microsoft Teams
Bandwidth Considerations
# Bandwidth Planning – Audio

<table>
<thead>
<tr>
<th>N Participants</th>
<th>Max number of Streams</th>
<th>Total Maximum upload or download bit rates (Kbps)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>100</td>
</tr>
</tbody>
</table>

Microsoft Teams
Meeting layouts

Single video
- Full Screen Video

Two videos

Three videos

Microsoft Teams
More meeting layouts

Four videos

Viewing screen sharing

Viewing screen sharing plus videos
## Bandwidth Planning – 1080p Screens: Download

<table>
<thead>
<tr>
<th></th>
<th>Max Resolutions</th>
<th>Total Maximum download bit rates (Mbps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Participants</td>
<td>1 * 1920x1080</td>
<td>4</td>
</tr>
<tr>
<td>3 Participants</td>
<td>2 * 1920x1080 (Full Bleed)</td>
<td>8</td>
</tr>
<tr>
<td>4 Participants</td>
<td>1 * 1920x1080 + 2 * 960x540</td>
<td>7</td>
</tr>
<tr>
<td>5+ Participants</td>
<td>4 * 960x540</td>
<td>6</td>
</tr>
<tr>
<td>Screen Sharing (Only)</td>
<td>1 * 1920x1080</td>
<td>4</td>
</tr>
<tr>
<td>Screen Sharing +</td>
<td></td>
<td></td>
</tr>
<tr>
<td>participant videos</td>
<td>[N=0-4]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 * 1920x1080 + N * 424x240</td>
<td>4 + (N*350 Kbps)</td>
</tr>
</tbody>
</table>
# Bandwidth Planning – 1080p Screens: Upload

<table>
<thead>
<tr>
<th>Participants</th>
<th>Max Resolutions</th>
<th>Total Maximum upload bit rates (Mbps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Participants</td>
<td>1 * 1920x1080</td>
<td>4</td>
</tr>
<tr>
<td>3 Participants</td>
<td>1 * 1920x1080 + 1 * 1280x720</td>
<td>6.5</td>
</tr>
<tr>
<td>4 Participants</td>
<td>1 * 1280x720 + 1 * 960x540</td>
<td>4</td>
</tr>
<tr>
<td>5+ Participants</td>
<td>1 * 960x540</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Active</strong> screen sharing (Only)</td>
<td>1 * 1920x1080</td>
<td>4</td>
</tr>
<tr>
<td><strong>Active</strong> screen sharing + participant videos</td>
<td>1 * 1920x1080 + 1 * 424x240</td>
<td>~4.34</td>
</tr>
</tbody>
</table>

Microsoft Teams
# Meetings Bandwidth Usage – Different Resolutions Screens or Viewing Layouts: Upload

<table>
<thead>
<tr>
<th>Participants</th>
<th>Max Resolutions</th>
<th>Total Maximum upload bit rates (Mbps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Participants</td>
<td>1 * 1920x1080</td>
<td>4</td>
</tr>
<tr>
<td>3 Participants</td>
<td>1 * 1920x1080 + 1 * 1280x720</td>
<td>6.5</td>
</tr>
<tr>
<td>4 Participants</td>
<td>1 * 1920x1080 + 1 * 1280x720 + 1 * 960x540</td>
<td>8</td>
</tr>
<tr>
<td>5+ Participants</td>
<td>1 * 1920x1080 + 1 * 1280x720 + 1 * 960x540 + 1 * 640x360</td>
<td>8.8</td>
</tr>
<tr>
<td>Video Based Screen Sharing (Only)</td>
<td>1 * 1920x1080 (Screen)</td>
<td>4</td>
</tr>
<tr>
<td>N Participant + VBSS</td>
<td>1 * 1920x1080 (Screen) + 1 * 1920x1080 (Video) + 1 * 1280x720 + 1 * 960x540</td>
<td>12</td>
</tr>
</tbody>
</table>
Office 365 Admin Portal
IT Admin Portal

• All settings can be adjusted from O365 Admin Center. Find Settings then navigate to Services & Add-Ins.
• All experience settings are at the Tenant level.
• All users at launch will have access to Microsoft Teams once the Tenant has Microsoft Teams enabled.
Office 365 Licensing Requirements

Microsoft Teams is currently available in preview to customers with
• Business Essentials
• Business Premium
• Enterprise E1, E3, and E5 subscriptions.
• Existing E4 subscriptions (Retired SKU)
During this initial preview launch of Microsoft Teams, the product will be disabled by default for all organizations. IT Admins need to go into the Admin Portal and enable the product for your organization.

Microsoft Teams
Enable Microsoft Teams

Microsoft Teams

Turn Microsoft Teams on or off for your entire organization

Save  Close
General Tenant Level Settings

Microsoft Teams

- Turn Microsoft Teams on or off for your entire organization
- General
  - Show organization chart in personal profile
  - Allow email notifications
  - Send your diagnostic data to Microsoft and help improve Microsoft Teams
- Teams & Channel
- Calls & Meetings
- Messaging
- Tabs
- Bots

Save  Close
Teams management

Microsoft Teams

Turn Microsoft Teams on or off for your entire organization

- General
- Teams & Channel
  - Go to Groups control panel to manage Team creation, owner and member assignments
- Calls & Meetings
- Messaging
- Tabs
- Bots

Save  Close
# Calls and Meetings

**Microsoft Teams**

<table>
<thead>
<tr>
<th>Option</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn Microsoft Teams on or off for your entire organization</td>
<td>On</td>
</tr>
<tr>
<td><strong>General</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Teams &amp; Channel</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Calls &amp; Meetings</strong></td>
<td></td>
</tr>
<tr>
<td>Allow video in meetings</td>
<td>On</td>
</tr>
<tr>
<td>Allow screen sharing in meetings</td>
<td>On</td>
</tr>
<tr>
<td><strong>Messaging</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Tabs</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Bots</strong></td>
<td></td>
</tr>
</tbody>
</table>

[Save]  [Close]
Messaging

Turn Microsoft Teams on or off for your entire organization: On

- **General**
- **Teams & Channel**
- **Calls & Meetings**
- **Messaging**
  - Add fun animated images to the conversations: On
  - Content Rating: Strict
  - Add customizable images from the internet: On
  - Add editable images to the conversations: On

- **Tabs**
- **Bots**

Save | Close
Tabs

Microsoft Teams

Turn Microsoft Teams on or off for your entire organization

- General
- Teams & Channel
- Calls & Meetings
- Messaging
- Tabs
  Enable extension tabs in Microsoft Teams
- Bots

Save  Close
Bots

Microsoft Teams

Turn Microsoft Teams on or off for your entire organization

- General
- Teams & Channel
- Calls & Meetings
- Messaging
- Tabs
- Bots

Enable bots in Microsoft Teams to help users
complete more tasks easily
Enable side loading of external bots

Save Close
Client Rollout
Platform Requirements

Clients:
• Windows 7+ (7, 8, 8.1, 10)
• Mac OSX 10.10+
• Windows Phone 10.0.10586+
• Android 4.4+
• iOS (iPhone and iPad) 9+

Web:
• Chrome: 51.0+
• Firefox: 47.0+
• Edge: 12+
• Microsoft Internet Explorer: 11+
• Safari coming soon.
Desktop Client

• Desktop client required for Real Time Communication
• The latest version of Microsoft Teams is located at https://teams.microsoft.com/downloads for all available platforms
• Users can install directly from https://teams.microsoft.com
• Distribute Microsoft Teams using your existing SCCM, Casper, or other channels
Mobile Clients

• The Microsoft Teams client available in the respective app stores
  • Apple’s App Store
  • Google Play Store
  • Microsoft’s Store
• The client cannot be side-loaded or distributed through MDM
Client Updates

- Desktop clients will all auto-update
- Mobile clients update through the app store
- Web Client will also auto-update

Microsoft Teams
Chat Services
Chat Message Storage

• Customer data is encrypted at rest and in transit
• All data store in regional clouds based on AAD Settings
• Microsoft Teams Chat Service runs within the O365 compliance boundary
• Microsoft Teams retains all messages
• Microsoft Teams retains deleted messages for at least 7 days and at most 30 days before messages are permanently deleted
Microsoft Teams Compliance

• Microsoft Teams was architected with compliance, authentication and privacy in mind.

• Microsoft Teams is targeting Tier-C Compliance
  • Industry standards: ISO 27001, ISO 27018, EUMC, SSAE16 SOC1 Type I & II, SOC2 Type I and II, HIPPA, FERPA, GLBA

• Protects data securely using strong security measures including two factor authentication, hard passwords and access policies.
Resources
Download Links

• Desktop Clients
  https://teams.microsoft.com/downloads

• Apple’s App Store – iOS
  http://aka.ms/iosteams

• Google Play Store – Android
  http://aka.ms/androidteams

• Microsoft’s Store – Windows Phone
  http://aka.ms/wpteam
Reference Items

- Microsoft Teams Readiness
  https://aka.ms/microsoft-teams-readiness
- Administrator settings for Microsoft Teams
  https://support.office.com/article/3966a3f5-7e0f-4ea9-a402-41888f455ba2
- Frequently asked questions about Microsoft Teams – Admin Help
  https://support.office.com/article/05cbe533-2181-4e95-a4b0-52cd7695fafc
- Office 365 URLs and IP address ranges
  - RSS Feed: https://support.office.com/en-us/o365ip/rss
Development Documentation

• Microsoft Teams Tabs Platform
  https://aka.ms/microsoftteamstabsplatform

• Bots in Microsoft Teams
  https://aka.ms/microsoftteamsbotsplatform

• Office Connectors in Microsoft Teams
  https://aka.ms/microsoftteamsconnectorsplatform
Product Videos

For more product information, you can check out the videos below:

• Product Walkthrough: https://support.office.com/en-us/article/Microsoft-Teams-Quick-Start-422bf3aa-9ae8-46f1-83a2-e65720e1a34d?ui=en-US&rs=en-US&ad=US#ID0EAAABAAA=Overview

• Onboard your Teams https://support.office.com/article/702a2977-e662-4038-bef5-bdf8ee47b17b

• Teams and Channels https://support.office.com/article/c3d63c10-77d5-4204-a566-53ddcf723b46

• Use Tabs https://support.office.com/article/7350a03e-017a-4a00-a6ae-1c9fe8c497b3

Microsoft Teams
Product Videos (Continued)

For more product information, you can check out the videos below:

• Productive Conversations
  https://support.office.com/article/99d33aaa-0743-47c6-a476-eb0a24abcb7e

• Private Conversations and Calling
  https://support.office.com/article/a864b052-5e4b-4ccf-b046-2e26f40e21b5

• Meet now
  https://support.office.com/article/26e06837-853d-4df1-a729-06bf700d4ecf

• Schedule a meeting
  https://support.office.com/article/ba44d0fd-da3c-4541-a3eb-a868f5e2b137

Microsoft Teams
Continue to Conversation

https://aka.ms/msteamscommunity
Thank you
Appendix Items
What is Tier C Compliance

Within the Microsoft compliance framework, Microsoft classifies Office 365 applications and services into four categories. Each category is defined by specific compliance commitments that must be met for an Office 365 service, or a related Microsoft service, to be listed in that category. Services in compliance categories C and D that have industry leading compliance commitments are enabled by default while services in categories A and B come with controls to enable or to disable these services for an entire organization. Details can be found in this Compliance Framework for Industry Standards and Regulations.