Život s Exchange Hybrid

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Setting the scene

"Hybrid (IT) is an approach to enterprise computing in which an organization provides and manages some information technology (IT) resources in-house but uses cloud-based services for others." ~ *someone on the internet*

What I mean with “hybrid” Exchange

An organization that has gone through the motions of running the Hybrid Configuration Wizard to:

1. Facilitate coexistence with Exchange Online, whilst maintaining to run an on-premises Exchange Organization for the foreseeable future.

2. Facilitate moving mailboxes to Exchange Online with no intention to continue running Exchange on-premises for the foreseeable future or to provide coexistence between both environments whilst migrating (except for mail flow).

Full Hybrid

Minimal Hybrid

Hybrid overview

Federation trust

Delegated authentication for on-premises/Office 365 web services

Enables free/busy, calendar sharing, message tracking & online archive

Native mailbox move

Online mailbox moves

Preserve the Outlook profile and offline folders

Leverages the Mailbox Replication Service (MRS)

Integrated admin experience

Manage all of your Exchange functions, whether Exchange Online or on-premises from the same place: Exchange Admin Center

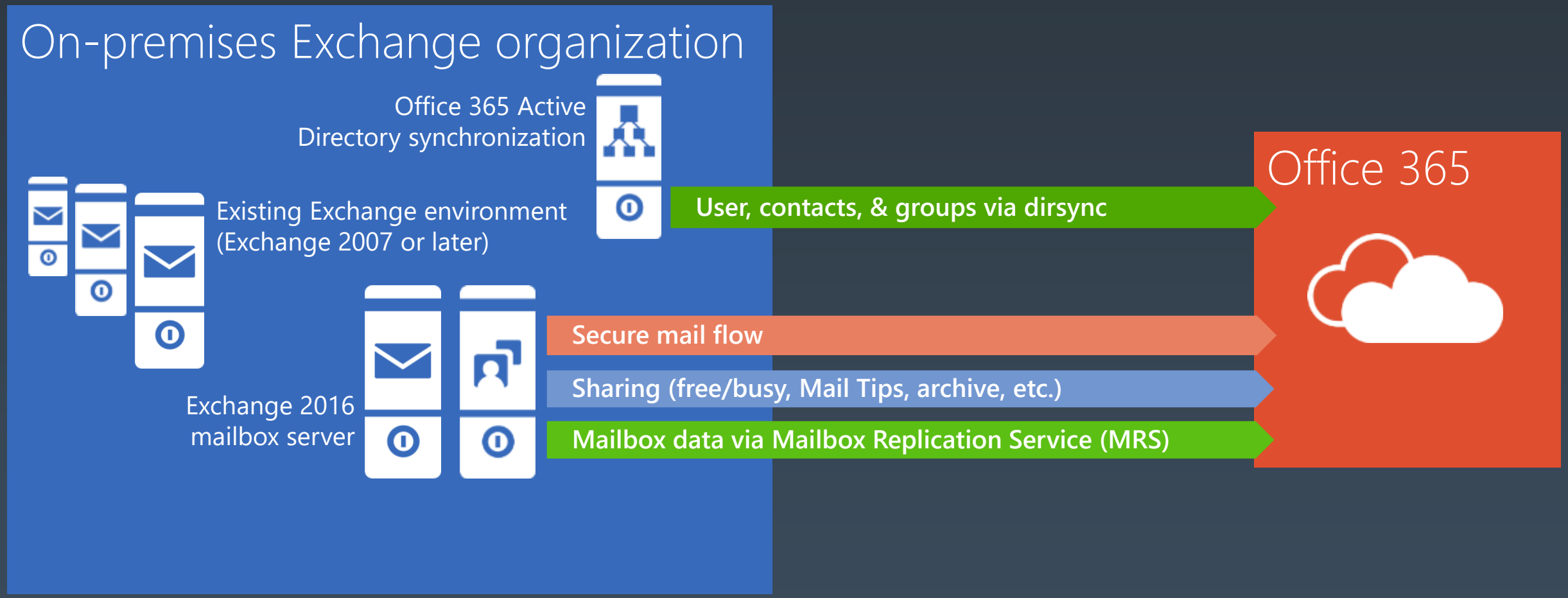
Secure mail flow

Authenticated and encrypted mail flow between on-premises and Exchange Online

Preserves the internal Exchange messages headers, allowing a seamless end user experience

Support for compliance mail flow scenarios (centralized transport)

Hybrid server roles

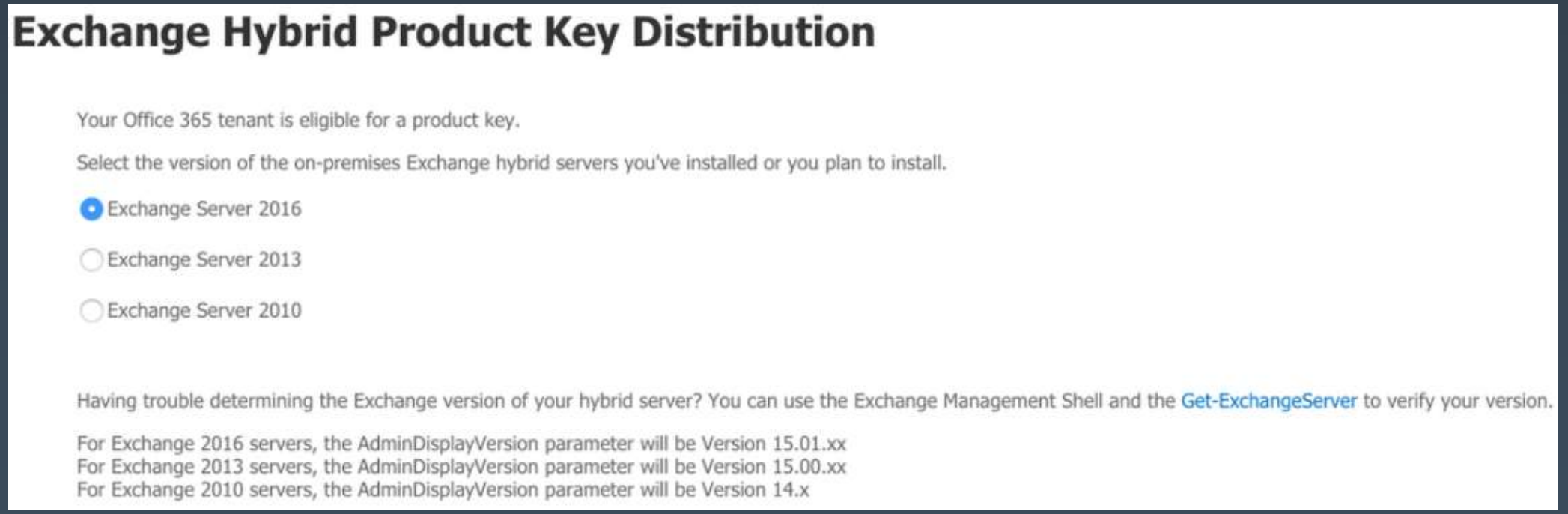


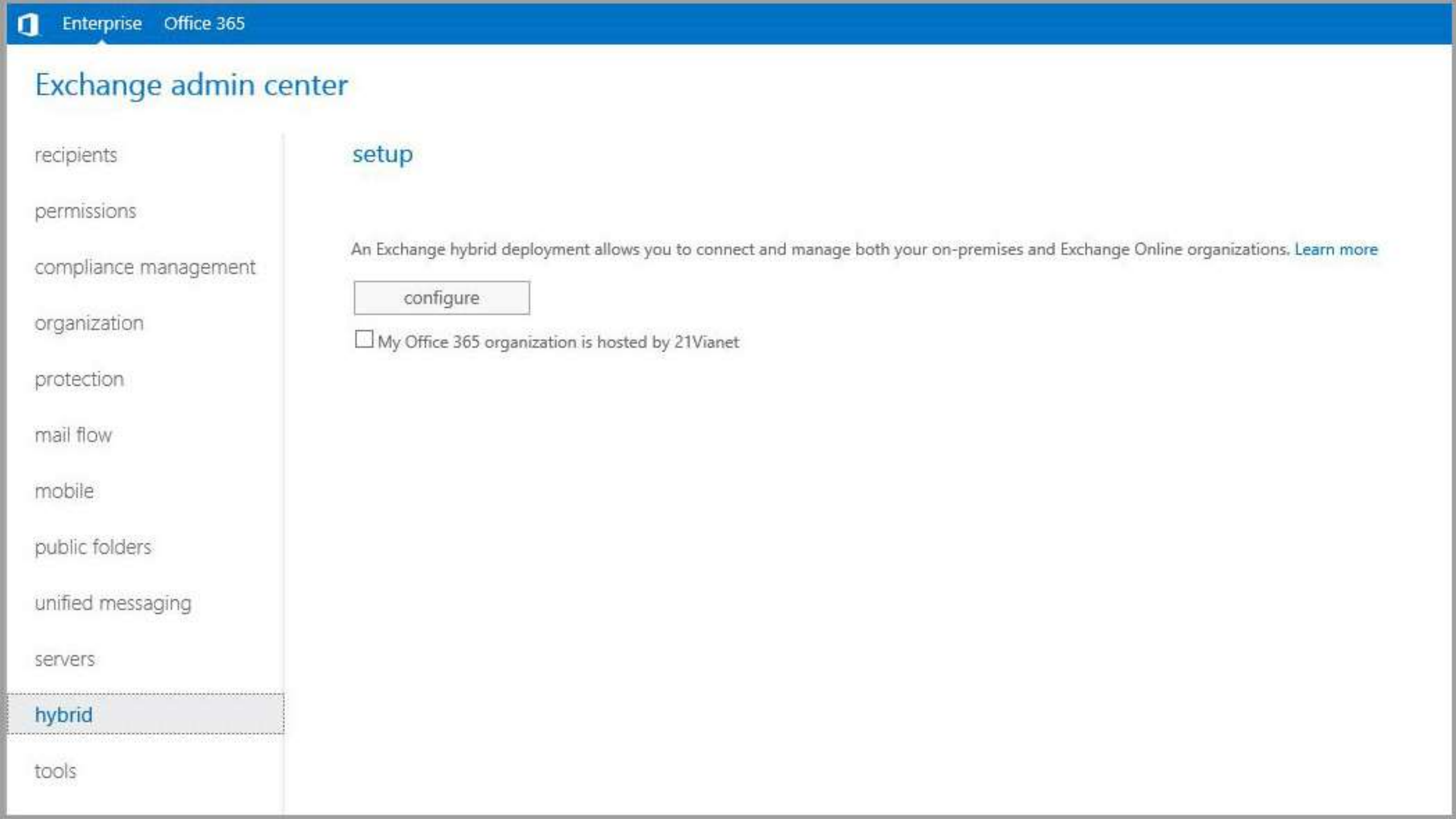
Hybrid Product Key

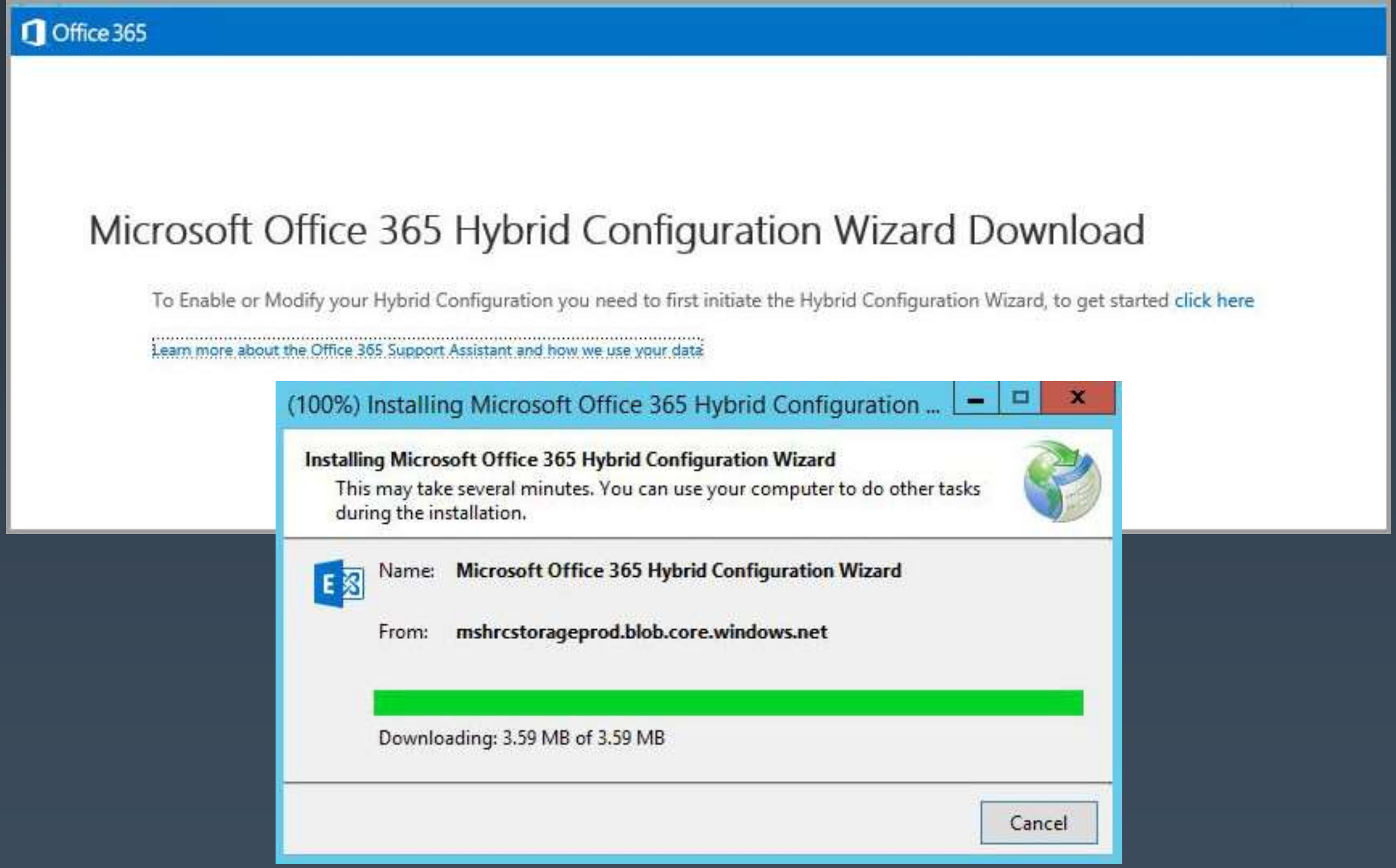
You get a free Hybrid Edition key if…

- You have an existing, non-trial, Office 365 Enterprise subscription
- You currently do not have a licensed Exchange 2013 or Exchange 2010 SP3 server in your on-premises organization.
- You will not host any on-premises mailboxes on the Exchange 2013 or Exchange 2010 SP3 server on which you apply the Hybrid Edition product key.

Short Link: http://aka.ms/hybridkey



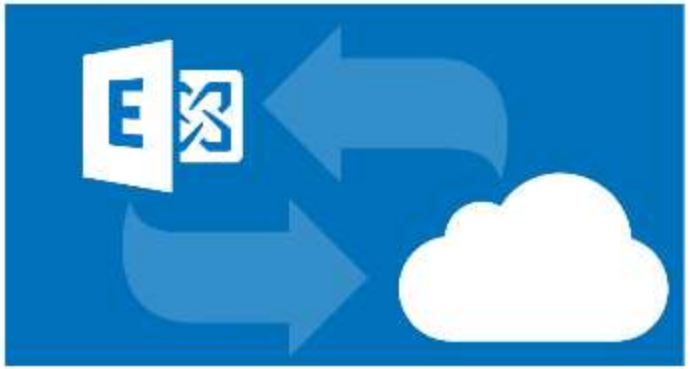

Enterprise
Office 365
Exchange admin center
recipients
permissions
compliance management
organization
protection
mail flow
mobile
public folders
unified messaging
servers
hybrid
tools
setup
An Exchange hybrid deployment allows you to connect and manage both your on-premises and Exchange Online organizations. Learn more
configure
My Office 365 organization is hosted by 21Vianet


Office 365
Microsoft Office 365 Hybrid Configuration Wizard Download
To Enable or Modify your Hybrid Configuration you need to first initiate the Hybrid Configuration Wizard, to get started click here
Learn more about the Office 365 Support Assistant and how we use your data
(100%) Installing Microsoft Office 365 Hybrid Configuration ...
Installing Microsoft Office 365 Hybrid Configuration Wizard
This may take several minutes. You can use your computer to do other tasks during the installation.
Name: Microsoft Office 365 Hybrid Configuration Wizard
From: mshrcstorageprod.blob.core.windows.net
Downloading: 3.59 MB of 3.59 MB
Cancel

Office 365 Office 365 Hybrid Configuration

Hybrid Configuration Wizard

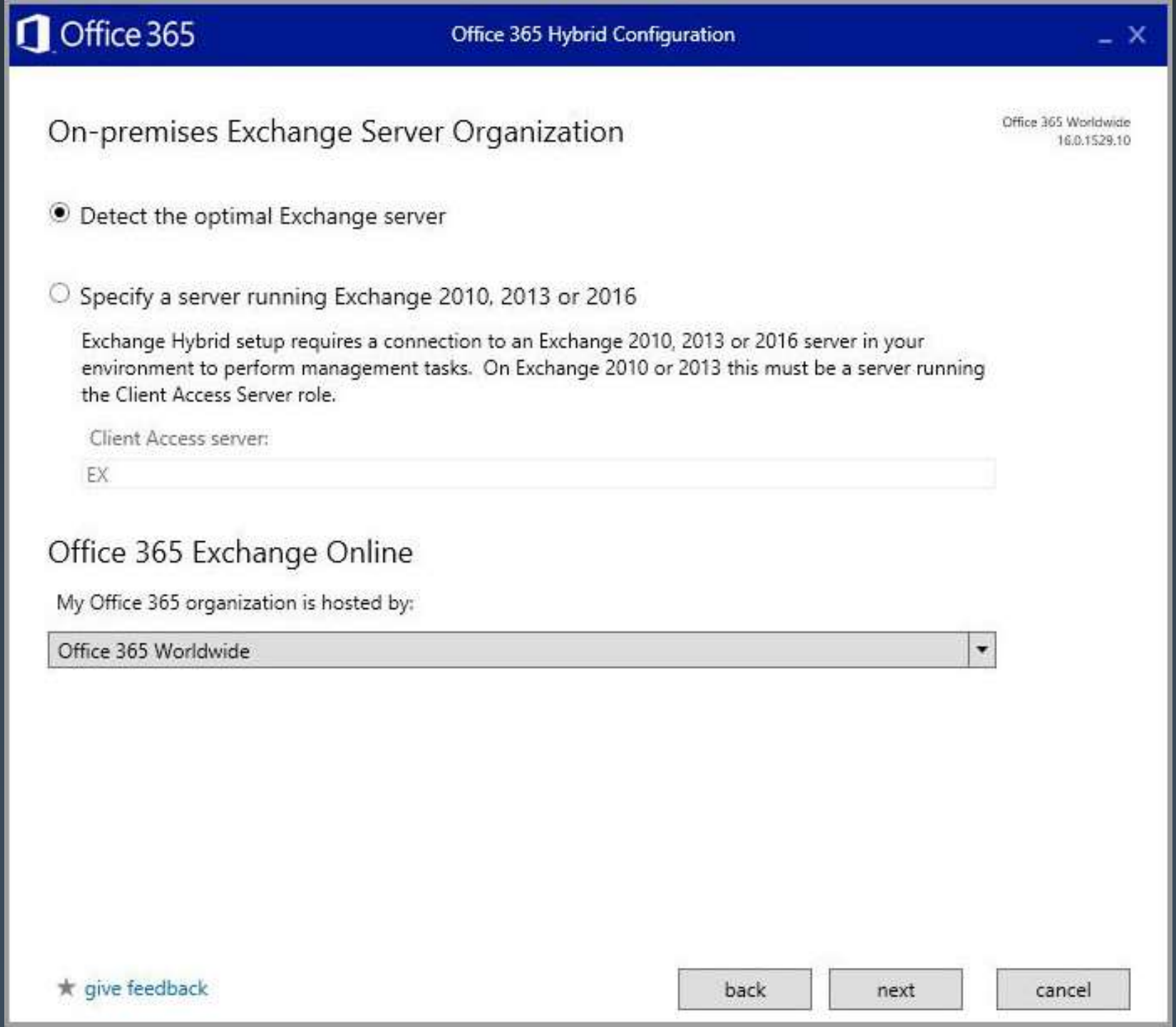
Office 365 Worldwide
DESKTOP-JO3PGRF
16.0.2223.0

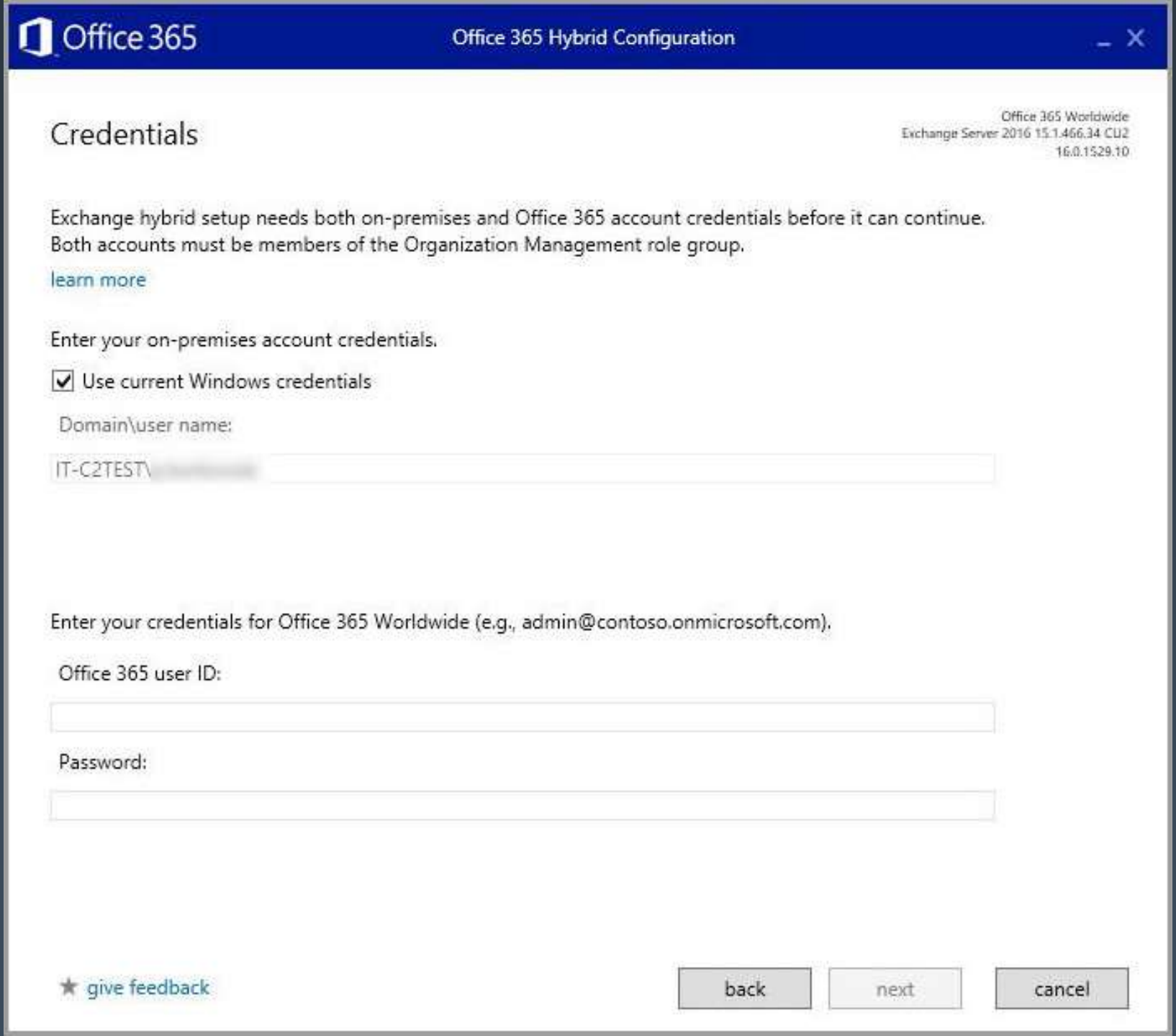


Running this wizard will configure coexistence between your on-premises environment and Exchange online.

What does this application do?

back next cancel


Office 365
Office 365 Hybrid Configuration
On-premises Exchange Server Organization
Office 365 Worldwide
16.0.1529.10
Detect the optimal Exchange server
Specify a server running Exchange 2010, 2013 or 2016
Exchange Hybrid setup requires a connection to an Exchange 2010, 2013 or 2016 server in your environment to perform management tasks. On Exchange 2010 or 2013 this must be a server running the Client Access Server role.
Client Access server:
EX
Office 365 Exchange Online
My Office 365 organization is hosted by:
Office 365 Worldwide
give feedback
back
next
cancel


Office 365
Office 365 Hybrid Configuration
Credentials
Office 365 Worldwide
Exchange Server 2016 15.1.466.34 CU2
16.0.1529.10
Exchange hybrid setup needs both on-premises and Office 365 account credentials before it can continue.
Both accounts must be members of the Organization Management role group.
learn more
Enter your on-premises account credentials.
Use current Windows credentials
Domain\user name:
IT-C2TEST\
Enter your credentials for Office 365 Worldwide (e.g., admin@contoso.onmicrosoft.com).
Office 365 user ID:
Password:
give feedback
back
next
cancel

Office 365 Hybrid Configuration

Validating Connections and Credentials

Office 365 Worldwide
itc2test.onmicrosoft.com
Exchange Server 2016 15.1.466.34 CU2
16.0.1529.10

Getting configuration data...

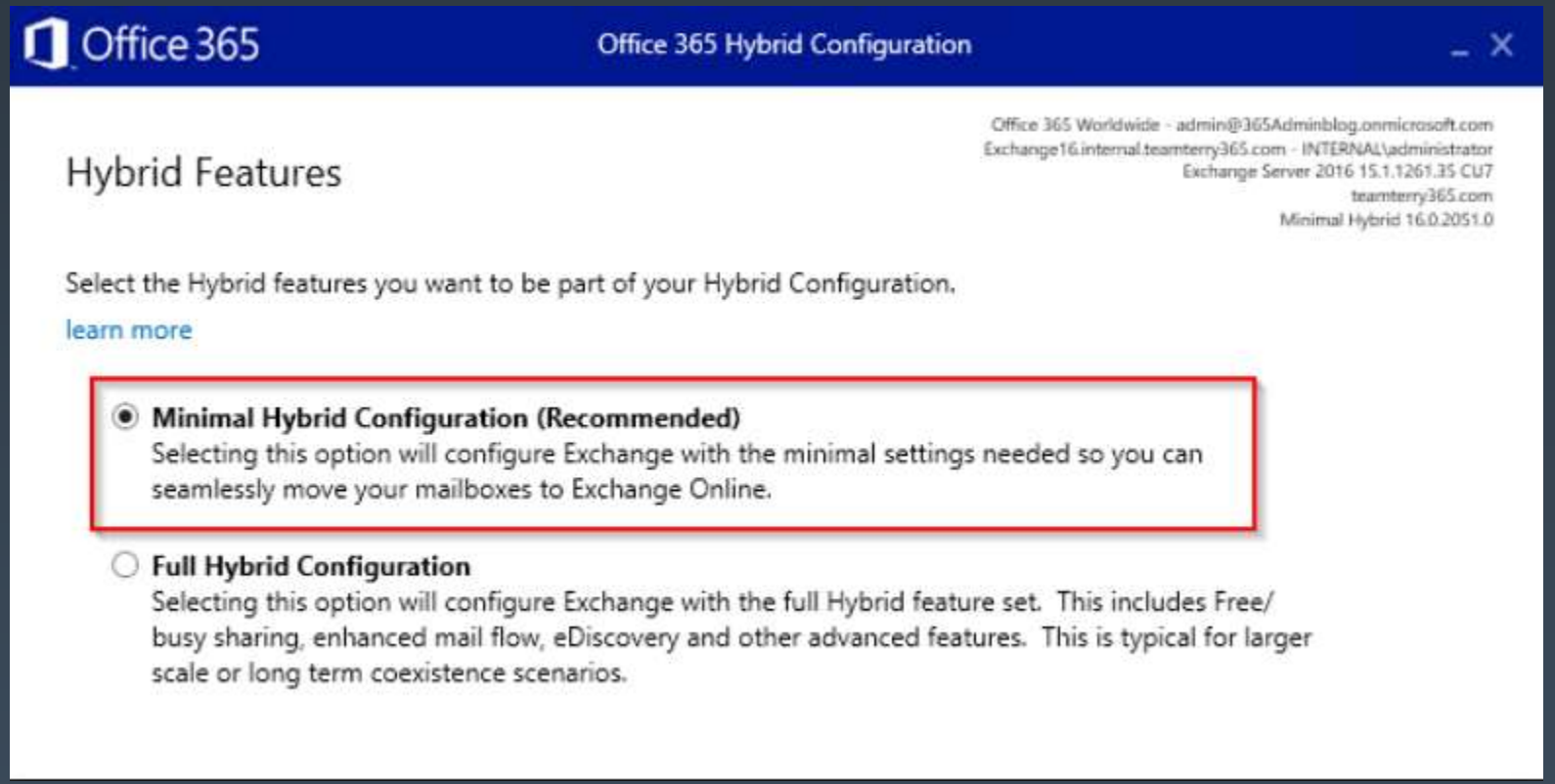
Exchange

Checking port 443 on host outlook.office365.com...

Office 365

★ give feedback

back | next | cancel


Office 365
Office 365 Hybrid Configuration
Hybrid Features
Office 365 Worldwide - admin@365Adminblog.onmicrosoft.com
Exchange16.internal.teamterry365.com - INTERNAL\administrator
Exchange Server 2016 15.1.1261.35 CU7
teamterry365.com
Minimal Hybrid 16.0.2051.0
Select the Hybrid features you want to be part of your Hybrid Configuration.
learn more
Minimal Hybrid Configuration (Recommended)
Selecting this option will configure Exchange with the minimal settings needed so you can seamlessly move your mailboxes to Exchange Online.
Full Hybrid Configuration
Selecting this option will configure Exchange with the full Hybrid feature set. This includes Free/busy sharing, enhanced mail flow, eDiscovery and other advanced features. This is typical for larger scale or long term coexistence scenarios.

Minimal hybrid

- Use minimal hybrid to migrate emails if you:
- Are running at least one Exchange 2010, Exchange 2013, and/or Exchange 2016 server on-premises.
- Plan to move to Exchange Online over a course of few weeks or less.
- Do not plan to continue to run directory synchronization to manage your users.

Office 365 Office 365 Hybrid Configuration

Office 365 Worldwide
it-c2test.com
itc2test.onmicrosoft.com
Exchange Server 2016 15.1.466.34 CU2
Full Hybrid 16.0.1529.5

Federation Trust

A federation trust isn't enabled and is required for Hybrid Configurations. Create a federation trust to enable users in your organization to share calendar free/busy information with Exchange Online and other federated Exchange organizations.

learn more

enable

★ give feedback

back next cancel

Office 365 | Office 365 Hybrid Configuration

Domain Ownership

Office 365 Worldwide
it-c2test.com
itc2test.onmicrosoft.com
Exchange Server 2016 15.1.466.34 CU2
Full Hybrid 16.0.1529.5

Before proceeding to the next step, copy the following tokens and create a TXT record for each token on your public DNS to confirm domain ownership.

learn more

Domain	Status	Token
it-c2test.com	Need TXT record	tmlGzaBI2D3mFvRfHpd3GmN6ZWE

copy to clipboard copy to notepad

☐ I have created a TXT record for each token in DNS.

verify domain ownership

★ give feedback

back next cancel

Office 365 Office 365 Hybrid Configuration

Hybrid Configuration

Office 365 Worldwide
it-c2test.com
itc2test.onmicrosoft.com
Exchange Server 2016 15.1.466.34 CU2
Full Hybrid 16.0.1529.10

How do you want to configure your on-premises organization for secure bi-directional mail transport with your Exchange Online organization?

learn more

- (•) Configure my Client Access and Mailbox servers for secure mail transport (typical)
- ( ) Configure my Edge Transport servers for secure mail transport

Centralized mail transport is an advanced feature that most organizations will not require. Enabling this feature configures your Exchange Online organization to route email to or from external recipients through your on-premises Exchange organization. Please see the Exchange setup guide for more details.

learn more

- [x] Enable centralized mail transport

★ give feedback

back next cancel

Office 365 Hybrid Configuration

Receive Connector Configuration

Office 365 Worldwide
it-c2test.com
itc2test.onmicrosoft.com
Exchange Server 2016 15.1.466.34 CU2
Full Hybrid 16.0.1529.10

Choose one or more on-premises Exchange Servers to host receive connectors for secure mail transport with Exchange Online. If you are using Exchange 2013 these servers must have the Client Access Server role.

learn more

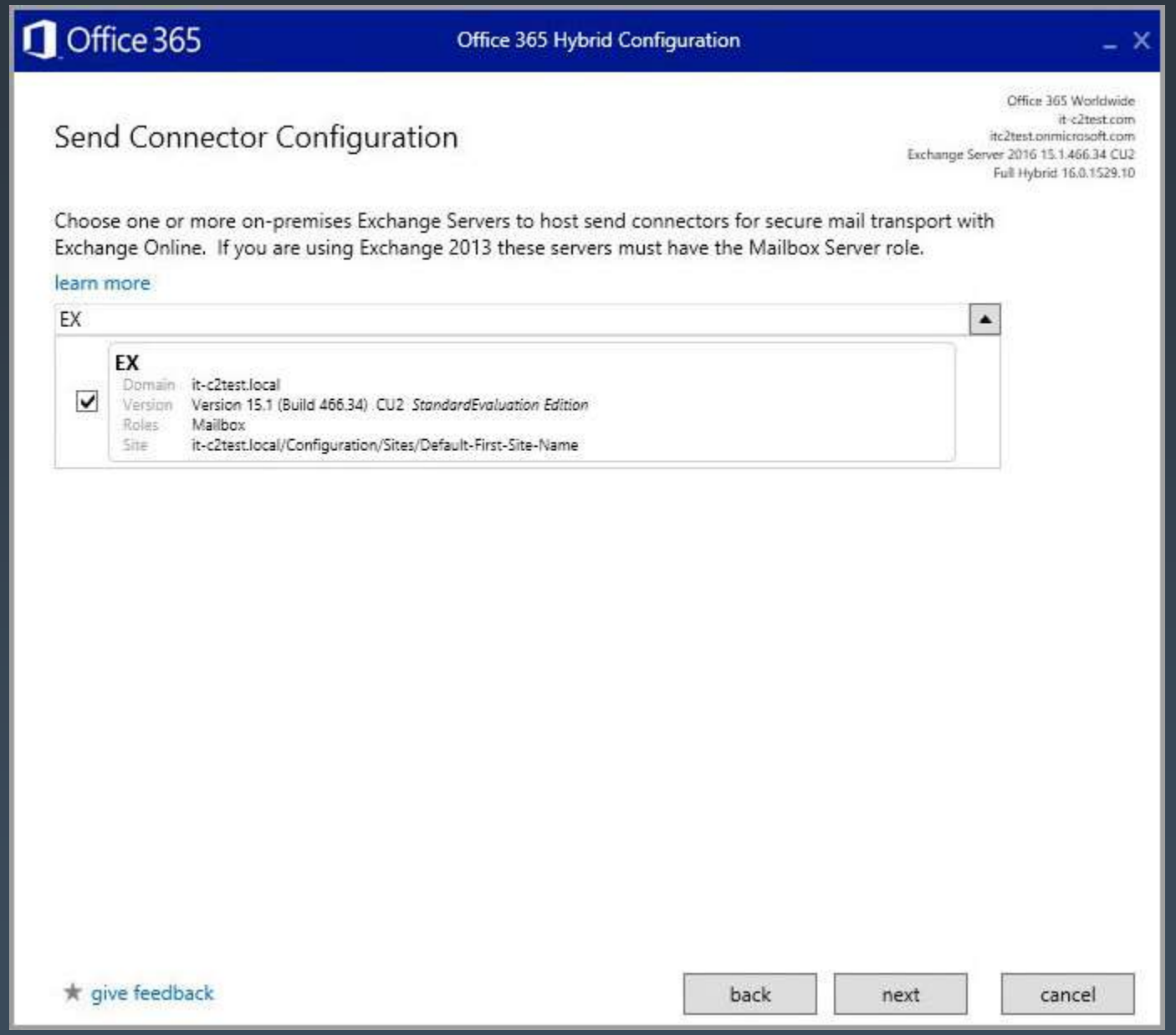
EX

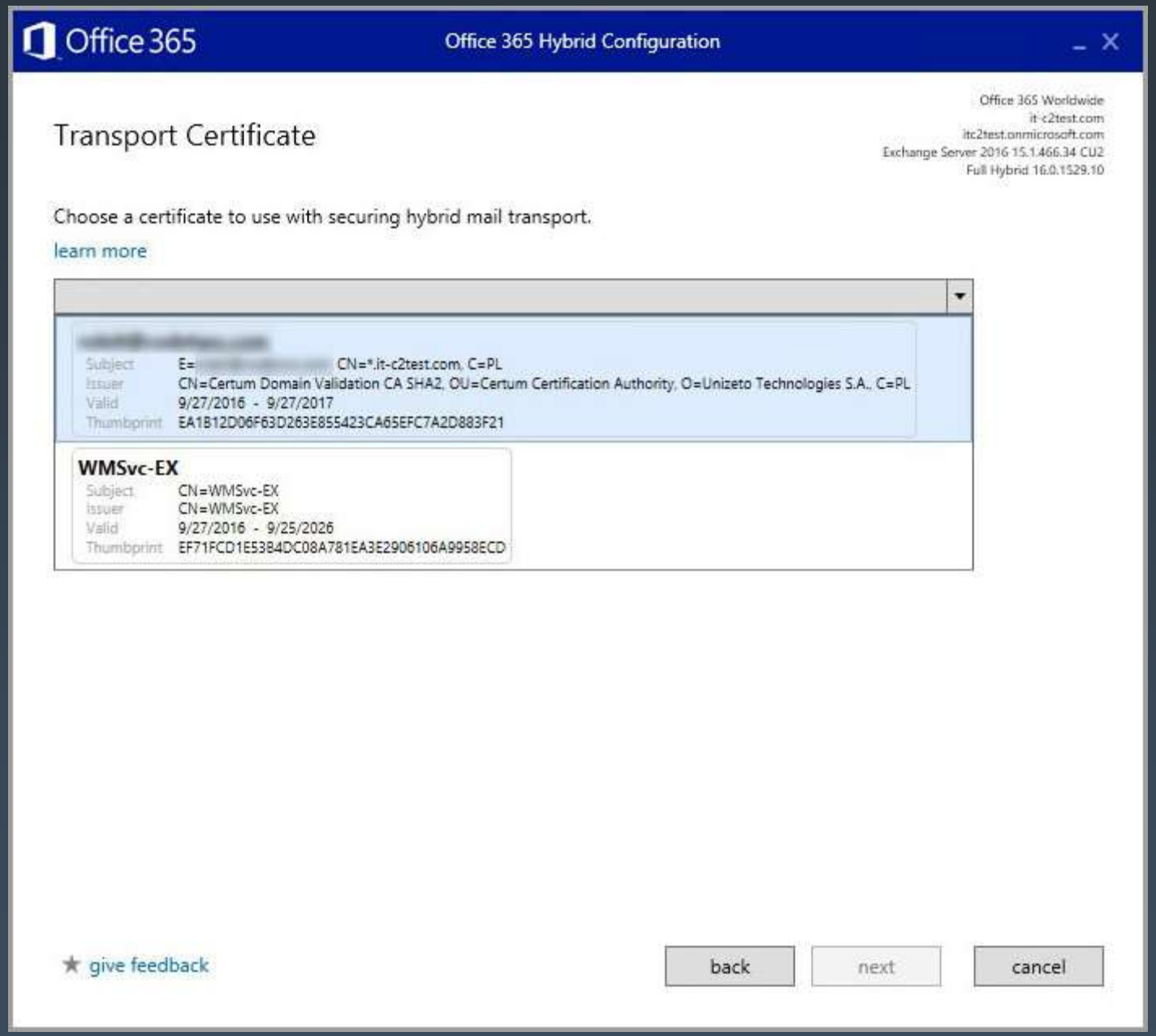
EX

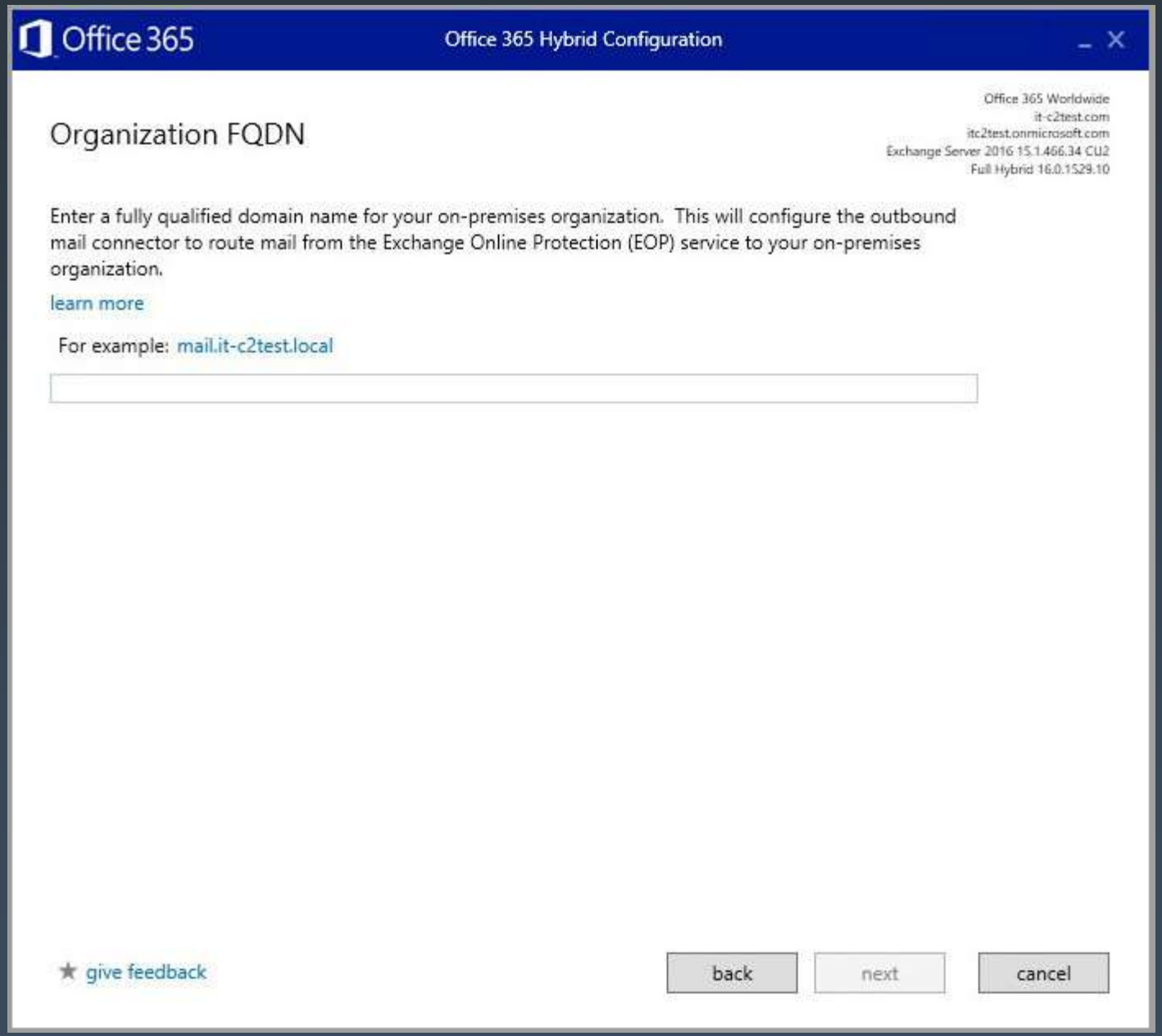
Domain	it-c2test.local
Version	Version 15.1 (Build 466.34) CU2 *StandardEvaluation Edition*
Roles	Mailbox
Site	it-c2test.local/Configuration/Sites/Default-First-Site-Name

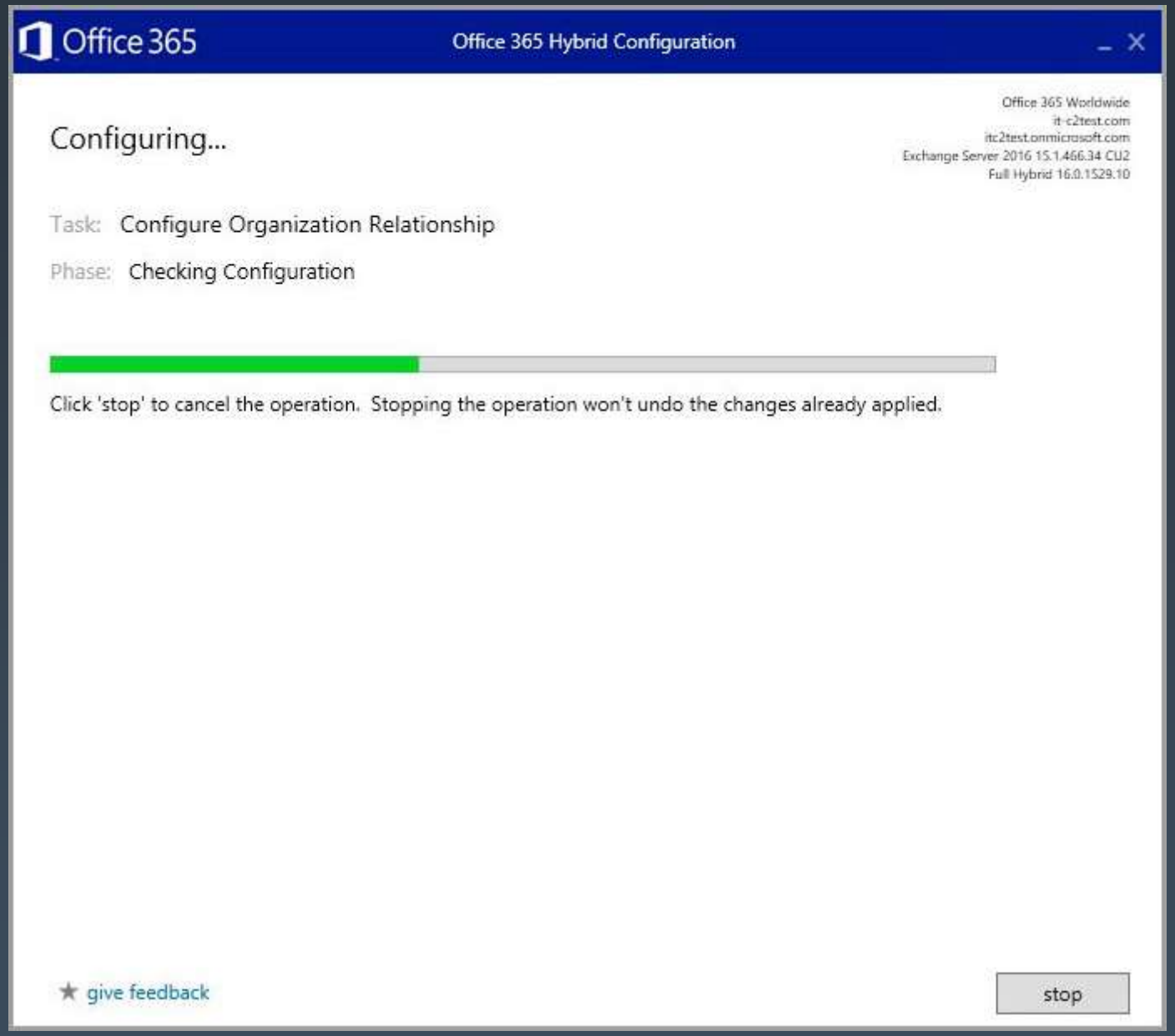
give feedback

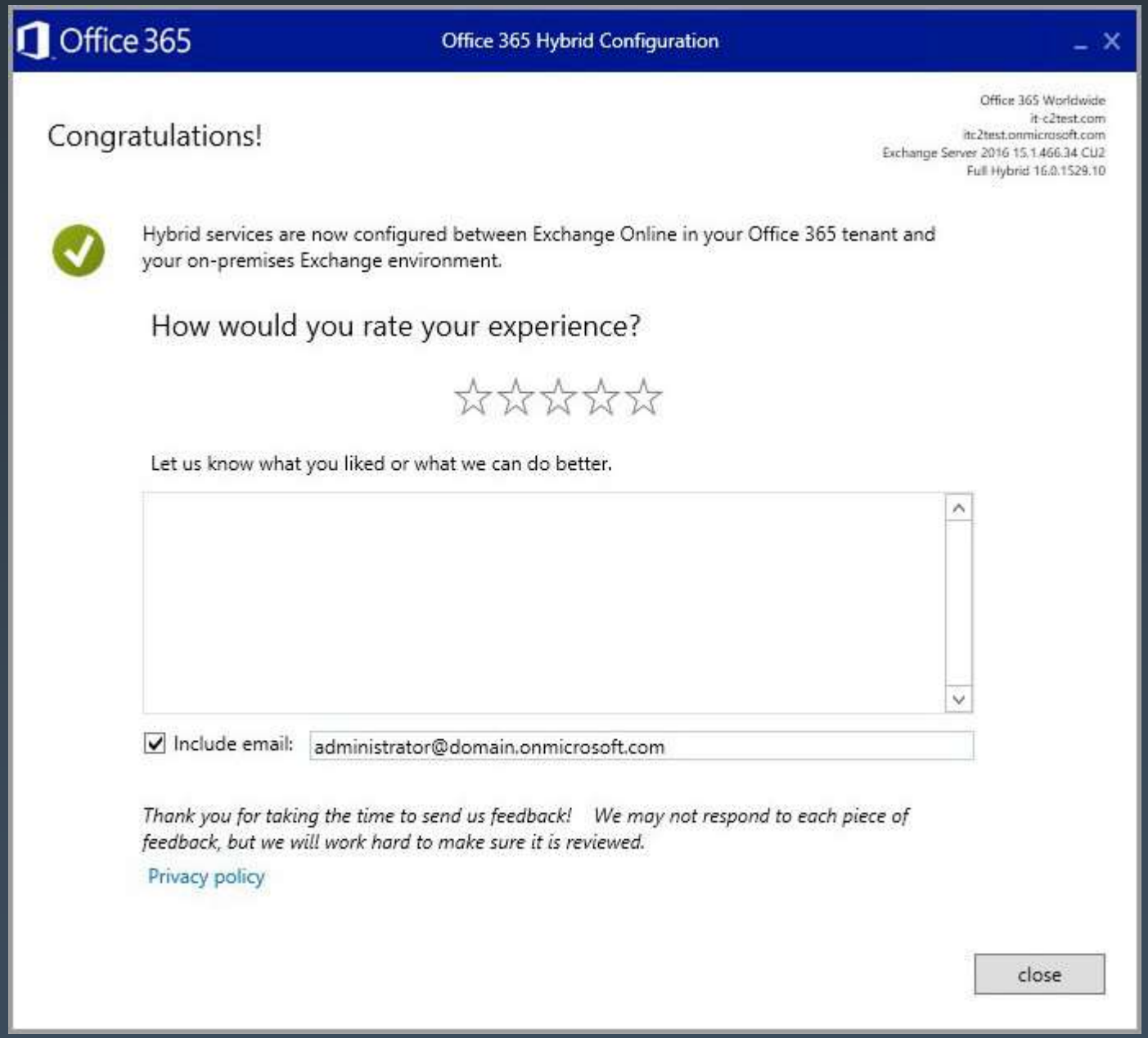
back next cancel


Office 365
Office 365 Hybrid Configuration
Send Connector Configuration
Office 365 Worldwide
it-c2test.com
itc2test.onmicrosoft.com
Exchange Server 2016 15.1.466.34 CU2
Full Hybrid 16.0.1529.10
Choose one or more on-premises Exchange Servers to host send connectors for secure mail transport with Exchange Online. If you are using Exchange 2013 these servers must have the Mailbox Server role.
learn more
EX
EX
Domain it-c2test.local
Version Version 15.1 (Build 466.34) CU2 StandardEvaluation Edition
Roles Mailbox
Site it-c2test.local/Configuration/Sites/Default-First-Site-Name
give feedback
back
next
cancel


Office 365
Office 365 Hybrid Configuration
Transport Certificate
Office 365 Worldwide
it-c2test.com
itc2test.onmicrosoft.com
Exchange Server 2016 15.1.466.34 CU2
Full Hybrid 16.0.1529.10
Choose a certificate to use with securing hybrid mail transport.
learn more
Subject E= CN=*.it-c2test.com, C=PL
Issuer CN=Certum Domain Validation CA SHA2, OU=Certum Certification Authority, O=Unizeto Technologies S.A., C=PL
Valid 9/27/2016 - 9/27/2017
Thumbprint EA1B12D06F63D263E855423CA65EFC7A2D883F21
WMSvc-EX
Subject CN=WMSvc-EX
Issuer CN=WMSvc-EX
Valid 9/27/2016 - 9/25/2026
Thumbprint EF71FCD1E5384DC08A781EA3E2906106A9958ECD
give feedback
back
next
cancel


Office 365
Office 365 Hybrid Configuration
Office 365 Worldwide
it-c2test.com
itc2test.onmicrosoft.com
Exchange Server 2016 15.1.466.34 CU2
Full Hybrid 16.0.1529.10
Organization FQDN
Enter a fully qualified domain name for your on-premises organization. This will configure the outbound mail connector to route mail from the Exchange Online Protection (EOP) service to your on-premises organization.
learn more
For example: mail.it-c2test.local
give feedback
back
next
cancel


Office 365
Office 365 Hybrid Configuration
Configuring...
Office 365 Worldwide
it-c2test.com
itc2test.onmicrosoft.com
Exchange Server 2016 15.1.466.34 CU2
Full Hybrid 16.0.1529.10
Task: Configure Organization Relationship
Phase: Checking Configuration
Click 'stop' to cancel the operation. Stopping the operation won't undo the changes already applied.
give feedback
stop


Office 365
Office 365 Hybrid Configuration
Congratulations!
Office 365 Worldwide
it-c2test.com
itc2test.onmicrosoft.com
Exchange Server 2016 15.1.466.34 CU2
Full Hybrid 16.0.1529.10
Hybrid services are now configured between Exchange Online in your Office 365 tenant and your on-premises Exchange environment.
How would you rate your experience?
Let us know what you liked or what we can do better.
Include email:
administrator@domain.onmicrosoft.com
Thank you for taking the time to send us feedback! We may not respond to each piece of feedback, but we will work hard to make sure it is reviewed.
Privacy policy
close

Common Questions

Common struggles

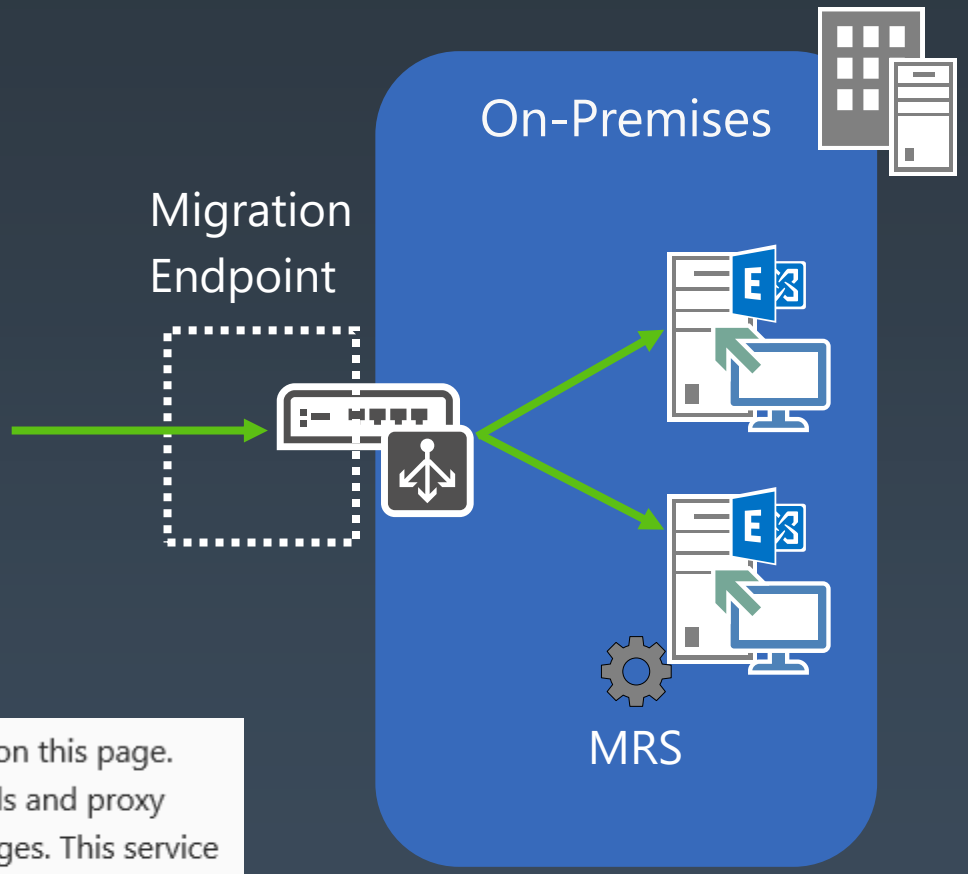
- How to deal with the fast pace of “the cloud”?
- How to move to the cloud in a reasonable time frame?
- Where will data be stored?
  - Technical Limitations > bandwidth, latency, etc.
  - Legal Implications > Local regulations
- What features will be made available?
  - Technical/Functional > are they useful to the organization
- The CISO, CSO, Security guy can be a real pain…

About that CISO, CSO, security-guy, ….

- Hybrid (or Office 365 FWIW), is **not** insecure.
  - A great read: MS Exchange Team Blog - "How hybrid authentication really works"
  - Office 365 Trust center is a great resource to answer a LOT of questions. Microsoft can help to further clarify questions not covered by Trust Center (NDA, …)
- You can deploy Hybrid, but you cannot publish OWA/AutoD/ActiveSync etc…
- We want to inspect **all** traffic to/from Exchange Online
- …

Securely publishing Exchange (hybrid)

- Define "secure" (*interpretation might vary depending whom you talk to…)*
- There's a difference between mailbox moves and other CoEx traffic
- Maintaining IP-based ACLs (firewall, reverse-proxy) can be challenging: RSS feed
  - Update



Note: Microsoft is developing a REST-based web service for the IP address and FQDN entries on this page. This new service will help you configure and update network perimeter devices such as firewalls and proxy servers. You can download the list of endpoints, the current version of the list, or specific changes. This service will eventually replace the XML document, RSS feed, and the IP address and FQDN entries on this page. To try out this new service, go to Web service.

When do I need to (re-) run the HCW?

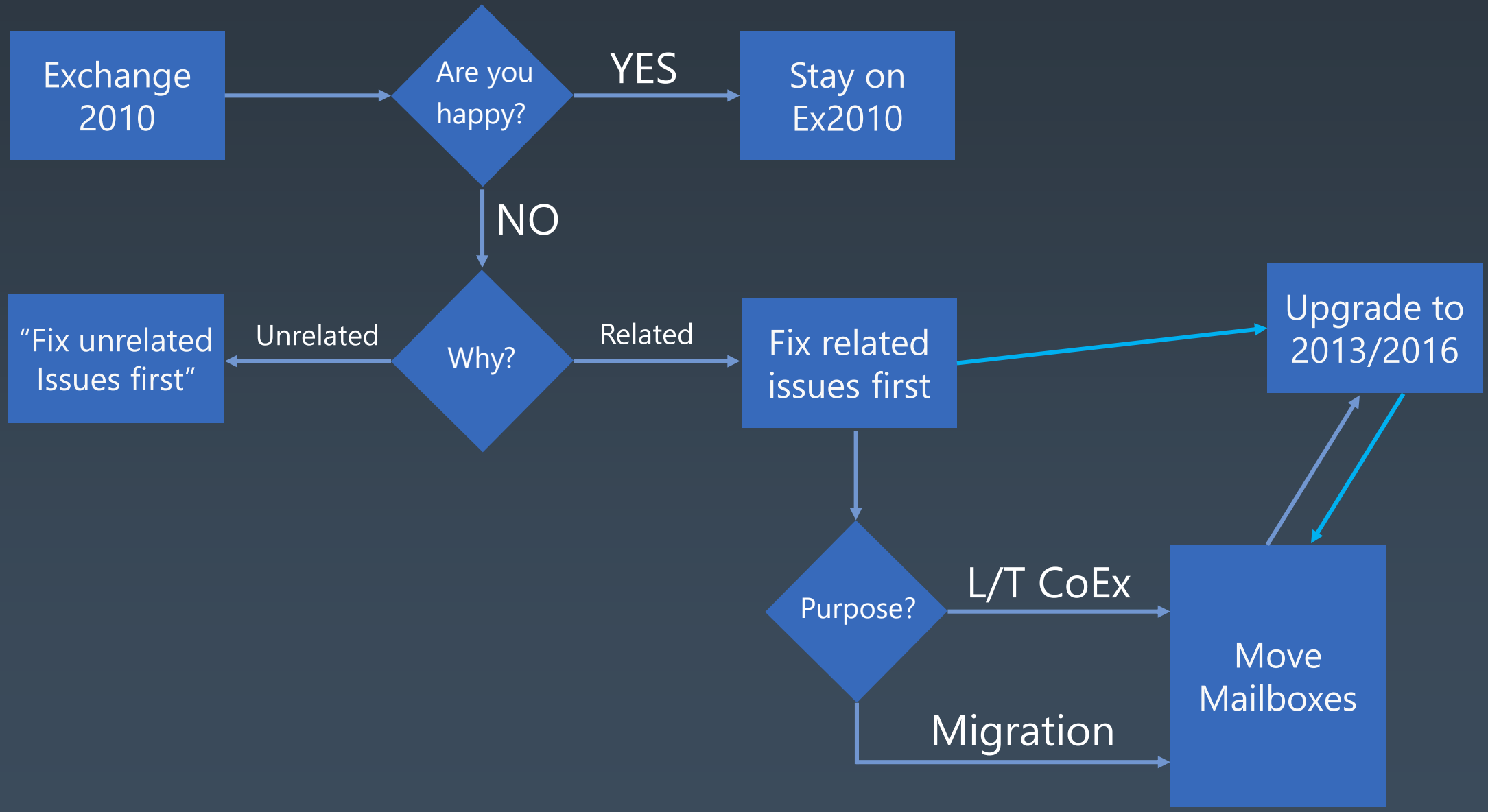
Yes

- When you update/modify transport certificate(s)
- When you add/remove accepted domains
- When you add/remove transport servers

No

- When you update Exchange on-premises (CUx > CUy)
- When you add a DAG
- When you modify Client Access settings

Do I need to upgrade “hybrid” servers?



Common mistakes & misconceptions and hybrid snafus

I just completed migrating to Exchange Online…

…but I need to keep my Exchange server?!

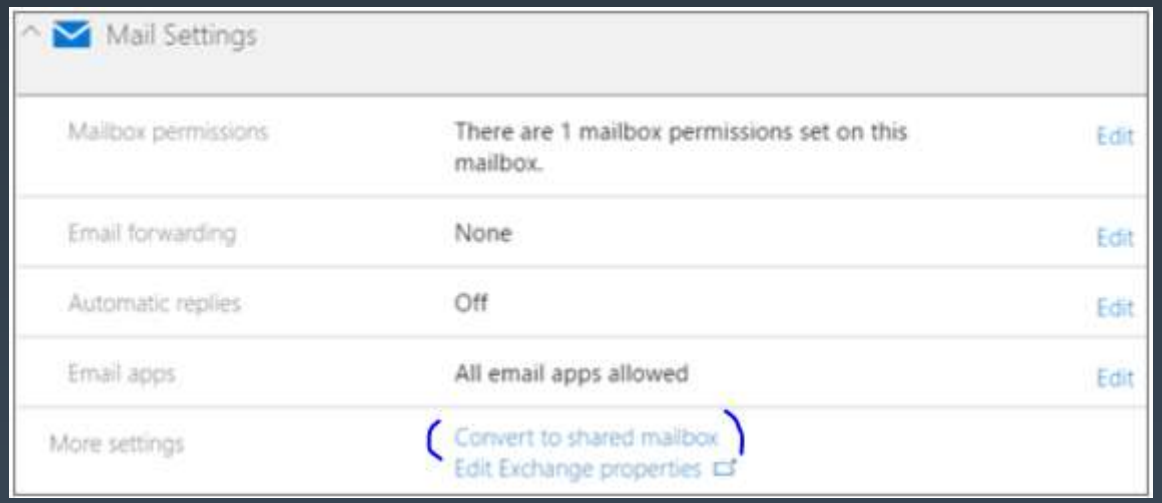
Identity = Root of all evil (*in this case*)

- As long as a customer is running Directory Synchronization (AAD Connect), an on-premises Exchange Server is needed to manage Exchange Online mailboxes.

Recipient Management			
	DirSync Disabled	DirSync Enabled	Hybrid
Exchange Online Mailbox	Managed in the cloud	Managed on-premises	Managed on-premises
Exchange Online Mail-Enabled User	Managed in the cloud	Managed on-premises	Managed on-premises

Complex recipient management

e.g. Convert a user mailbox to a shared mailbox



it's easy or not???

https://support.office.com/en-us/article/convert-a-user-mailbox-to-a-shared-mailbox-2e122487-e1f5-4f26-ba

Any other reason to keep Exchange around?

- **Exit-strategy**: if you keep Exchange around, you can choose to move messages back on-premises if you don't like it in the cloud*
- **SMTP-relay**: the on-premises Exchange server is an ideal candidate to allow (secure) SMTP relaying to Exchange Online. E.g. Multi-functional devices, scanners, faxes, etc…
- **Hybrid Public Folders**: Keep Public Folders on-premises (e.g. if you have more than 250k folders…)

Cross-premises permissions…

Sofie (Sales Director) just got moved to Office 365; she is happy that she can (finally) start using all those cool new features...

Mike (the IT-guy) is happy he moved his first batch of mailboxes to Office 365. In fact, he's already dreaming about his next vacation somewhere on a (remote) beach.

The morning after…

After a morning full of meetings, Sofie (Sales Director) just got a phone call from her secretary telling her she was unable to confirm her availability for an urgent meeting with one of her clients (she couldn't see her calendar). As a result, the client decided to take his business elsewhere… Infuriated, she calls Mike asking him what's happened *[drama: in a perhaps not so friendly tone]*

Mike starts investigating, and finds out here that delegate permissions are not supported in a hybrid deployment. This is something he was not prepared for! After all, the Microsoft sales rep recently told him that hybrid would be the answer to all of his problems! *[drama: he might not be able to afford his next vacation after all]*

Cross-premises permissions: reality (today)

Cross-premises permissions		
	On-Prem Mailbox	Cloud Mailbox
Cloud Mailbox (Full Access)	Works as expected. Permissions are migrated and can be assigned cross-premises.	Works as expected (both mailboxes in same environment)
Cloud Mailbox (Send-As)	Migrated permissions will work (IF assigned on-premises first). Cannot assign cross-premises permissions (thus won't work).	Works as expected (both mailboxes in same environment). Permissions stop working once mailbox is moved back to on-premises.
Cloud-Mailbox (Send-on-Behalf)	Migrated permissions will work (IF assigned on-premises first). New cross-premises permissions won't work (even after move).	Works as expected (both mailboxes in same environment). Permissions stop working once mailbox is moved back to on-premises.

Hybrid mes(s)(h)

Microsoft Federation Gateway

GASP

2 Exchange finds that Timothy is external, and that an Org. Relationship exists for Timothy's domain.

3 Exchange MFG requests a delegation token for Timothy's organization.

4 The MFG returns a valid token for Timothy's organization.

7 The answer Brianna's Exchange server got isn't exactly what it expected. Instead of launching another F/B lookup using the new recipient details, it does nothing...

Brianna D.

Comp. A On-Premises

onmicrosoft.com

Comp. B On-Premises

Timothy H.

TimH@compB.com

Comp. B Office 365

Hybrid Mesh

- Trusts aren't transitive. Applies to both OAUTH and DAUTH scenarios
- Workaround:
  - (Manually) implement GalSync between both organizations
  - Create Organization Relationships & Intra-Organization Connectors between all involved environments

Mailbox provisioning

- Creating mailboxes cross-premises can be confusing…
  - New-RemoteMailbox can create mailbox directly in Office 365; but creates a (potential) problem for offboarding.

```
ExchangeGuid             : 91dd04fb-4005-4281-999f-ebf7eef48f4d
MailboxContainerGuid     :
AggregatedMailboxGuids   : {}
ArchiveGuid              : 00000000-0000-0000-0000-000000000000
DisabledArchiveGuid      : 00000000-0000-0000-0000-000000000000
Guid                     : 89f3a048-82c8-4d26-8938-a52186a1eb25
```

  - Ideally, you create a new mailbox on-premises and move the (empty) mailbox to Office 365 (=cumbersome)

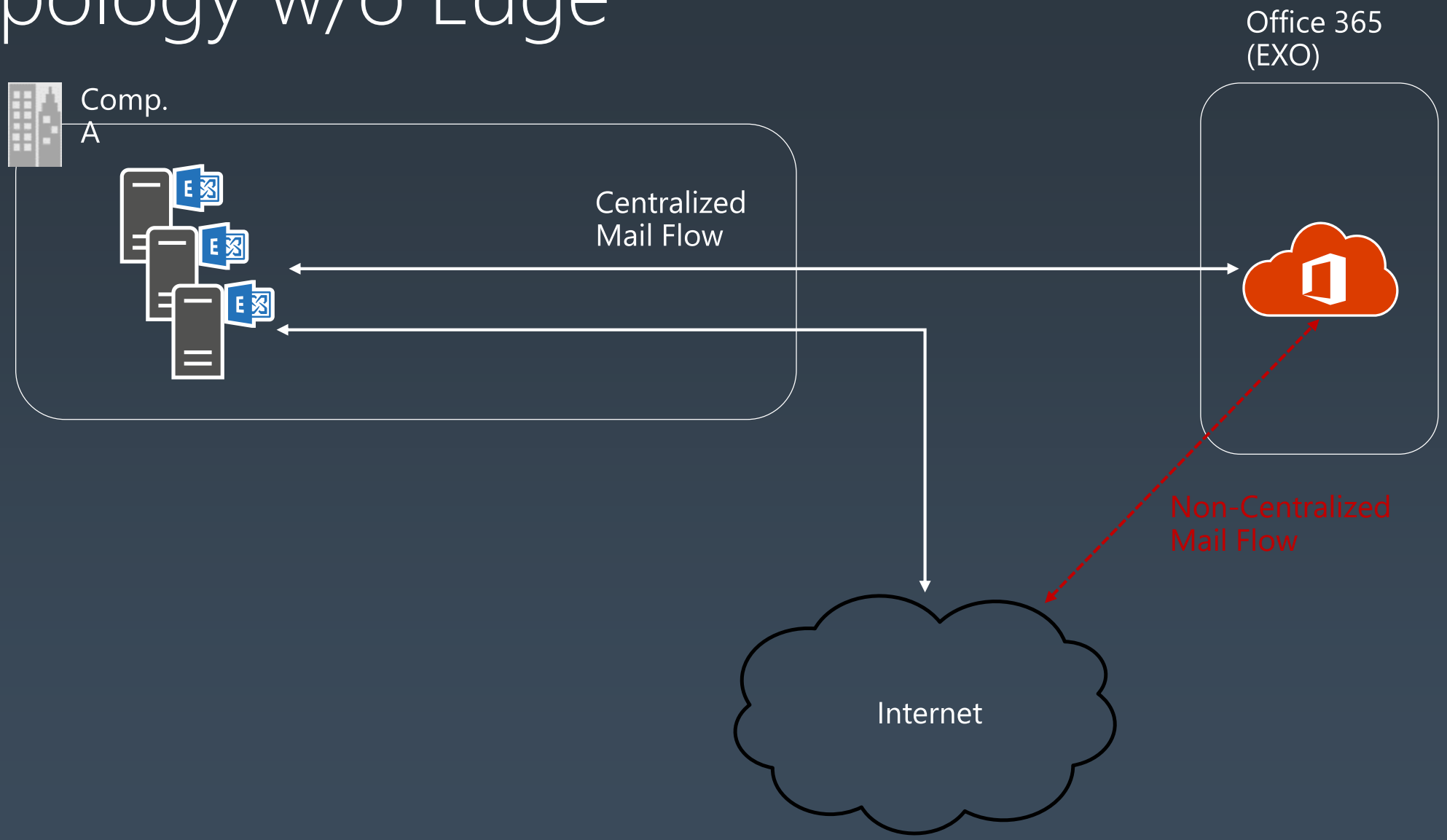
Exchange: Edge or no Edge?

- Edge Transport servers are not required, but can help overcome certain security requirements (i.e. “external connections must be terminated in DMZ”)
- Sizing Edge for (large) hybrid environments is not easy > no real guidance available
  - Size just like you would size regular transport servers (think about SafetyNet!)
  - Start small, scale up as needed
- (Third-party) routing agents can increase flexibility of deployment and migration (e.g. condition-based routing)

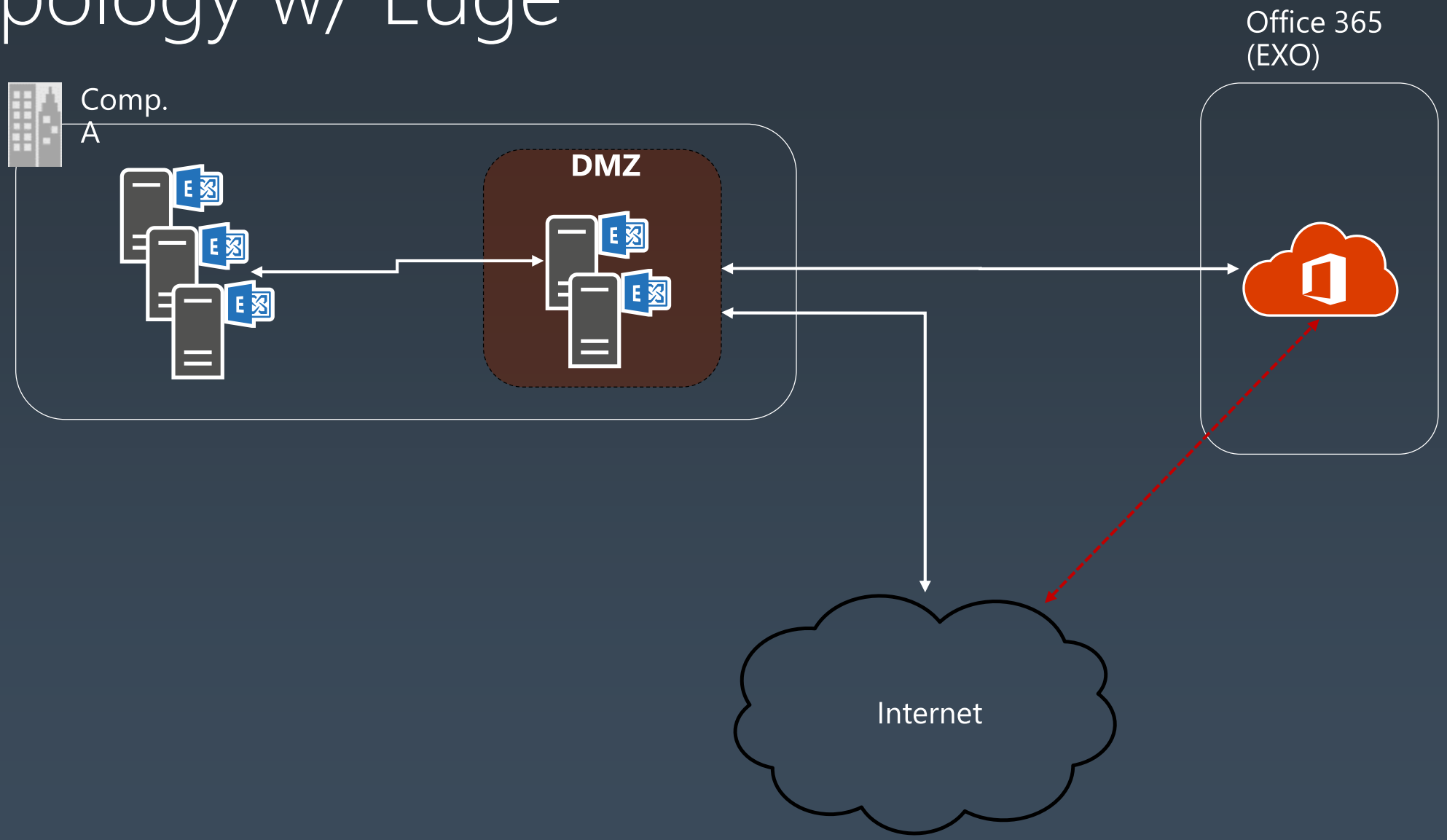
What is an Edge Transport server?

- Exchange Transport Server which can be installed in the perimeter network (aka "DMZ")
  - Can handle inbound/outbound email
  - Supports Transport Rules (though not 100% the same as regular Transport Servers)
    - You can deploy additional Transport Agents to extend functionality

Topology w/o Edge



Topology w/ Edge



Common "requirements" to implement Edge

- Terminate incoming (hybrid) connections in the "DMZ"
  - "regular" Exchange Server shouldn't be implemented in the DMZ (unless you want to make your firewall like Swiss cheese.
  - Since it's the only supported way to make hybrid mail flow work in this scenario, you basically have no other option…
- Have the ability to dynamically (re)route messages
  - Although capability also exists in "regular" Transport Services, Edge gives you the benefit being able to handle messages before they enter the [Exchange] organization.
- Address re-writing capabilities
  - Not particularly related to hybrid, but can be helpful in some scenarios.

Common reasons not to implement Edge

- Additional (Windows) servers to manage
- Not the best reputation for mail filtering
  - Little to no value if you already have alternative 3rd-party filtering solution
- Management can be a little daunting (PowerShell-only)
- Additional complexity. Less = More!

Why Should I Care About MA? What is it?

For this purposes of this discussion – MA provides the ability for desktop Outlook to authenticate to Exchange using a Token

As opposed to using Basic, NTLM, Kerberos, magic beans, etc.

Why is it 'Modern'? – great question.

Why is it 'better'? – Strong AuthN is good, MA allows you to much more easily perform Multi-Factor AuthN with Outlook and Exchange

Who is it good for? – Anyone with a security team that insists on MFA from outside the company firewall, or anyone who wants to improve the authentication of users to Exchange

Who is it not good for? – It relies on good network connectivity for token acquisition and renewal – so poor networks might rule you out

Some terminology

ADAL – Azure AD Authentication Library - API to be used by developers to implement Modern Authentication – it's the ADAL stack in Exchange and Outlook that add the ability to use OAuth

OAuth – Standards based protocol used for authentication

AD FS – On-Prem token issuing service providing Single Sign On services for external services/applications

EvoSTS – The token issuer for Azure AD

CA – Conditional Access - Allows the IT admin to only allow access based on certain conditions, usually location based or device based.

Outlook – the Exchange client

Exchange – Outlook Server

Overview of How It Works

In short – this is how it works

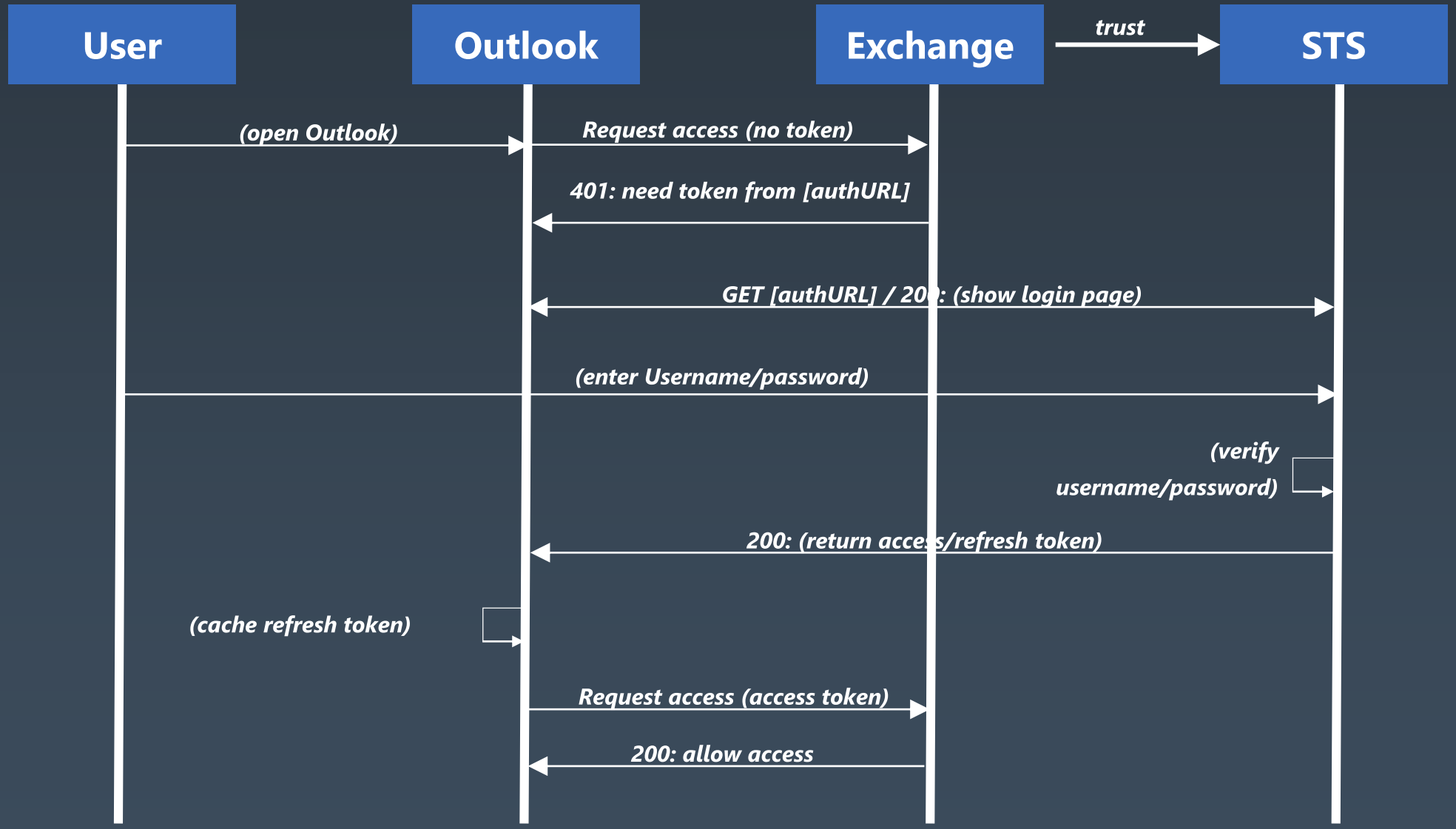
- Outlook indicates to Exchange it can do Modern Auth during the initial unauthenticated connection conversation
- Exchange responds with a redirect URL to the Security Token Service (STS)
- The user heads over there and authenticates – this could be simple creds, certificate, MFA, whatever the STS is configured to require
- Once the user is authenticated an OAuth token is passed to the client (2 actually –an Access (specific to the URL) token and a Refresh token)
- The client hands the Access token to Exchange and is authorized to access the resource and uses the Refresh token to renew the Access token as needed

MAPI-HTTP only, no Outlook Anywhere

Exchange does this for ALL connections, internal and external

Exchange no longer does the auth, so it's up to the STS to auth the user, enforce MFA

Initial Connection Without Token



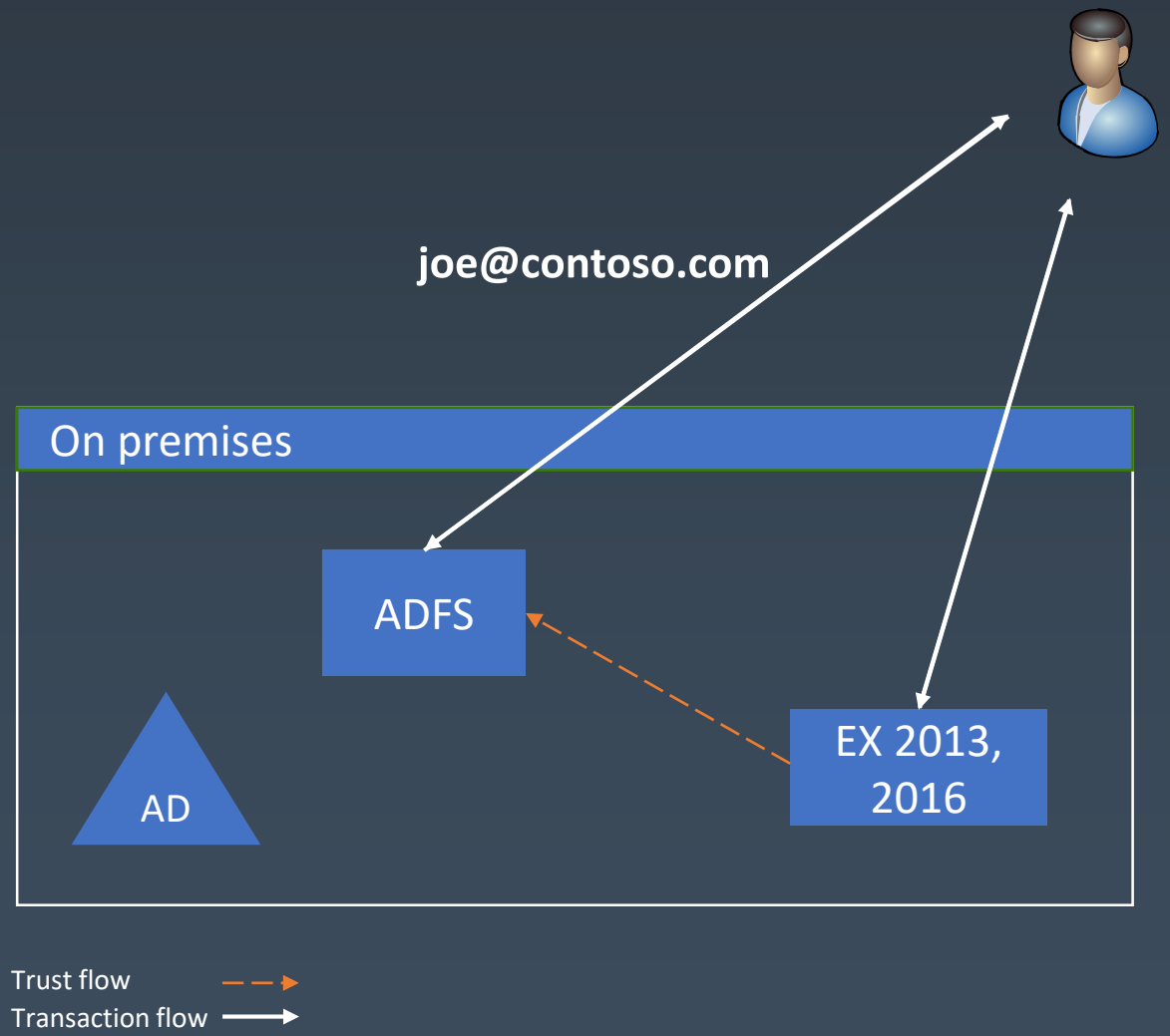
Two Flavours (I spell it like that)

- Pure On-Prem – Exchange Server 2019 Feature
- Hybrid with Azure AAD (HMA) – Announced support in Exchange 2013 CU19/ Exchange 2016 CU8
  - Both require you remove all 2010 Exchange from the Org.
  - Exchange 2013/16 won't proxy connections to 2010 if the client used OAuth.
  - Because the MA dance is done before we know where the user's mailbox is, a client with a mailbox on 2010 could authenticate to 2013/16 using MA, only to then fail once we proxy

Pure On-Prem – Coming in Exchange 2019

- Entry bar is higher, requires AD FS 2016, Outlook 2016
- AD FS does both AuthN and issuing of tokens
- Outlook 2016 **only**
- Exchange 2013/16 (no 2010 in org)
- Configuration at ADFS is a few custom rules, Outlook requires a secret reg key
- Device registration is required for device trust decisions
- Client sends empty Bearer header, Exchange responds with URL for AD FS, client goes to AD FS, gets token, presents to Exchange

Modern Auth – Pure On-Prem



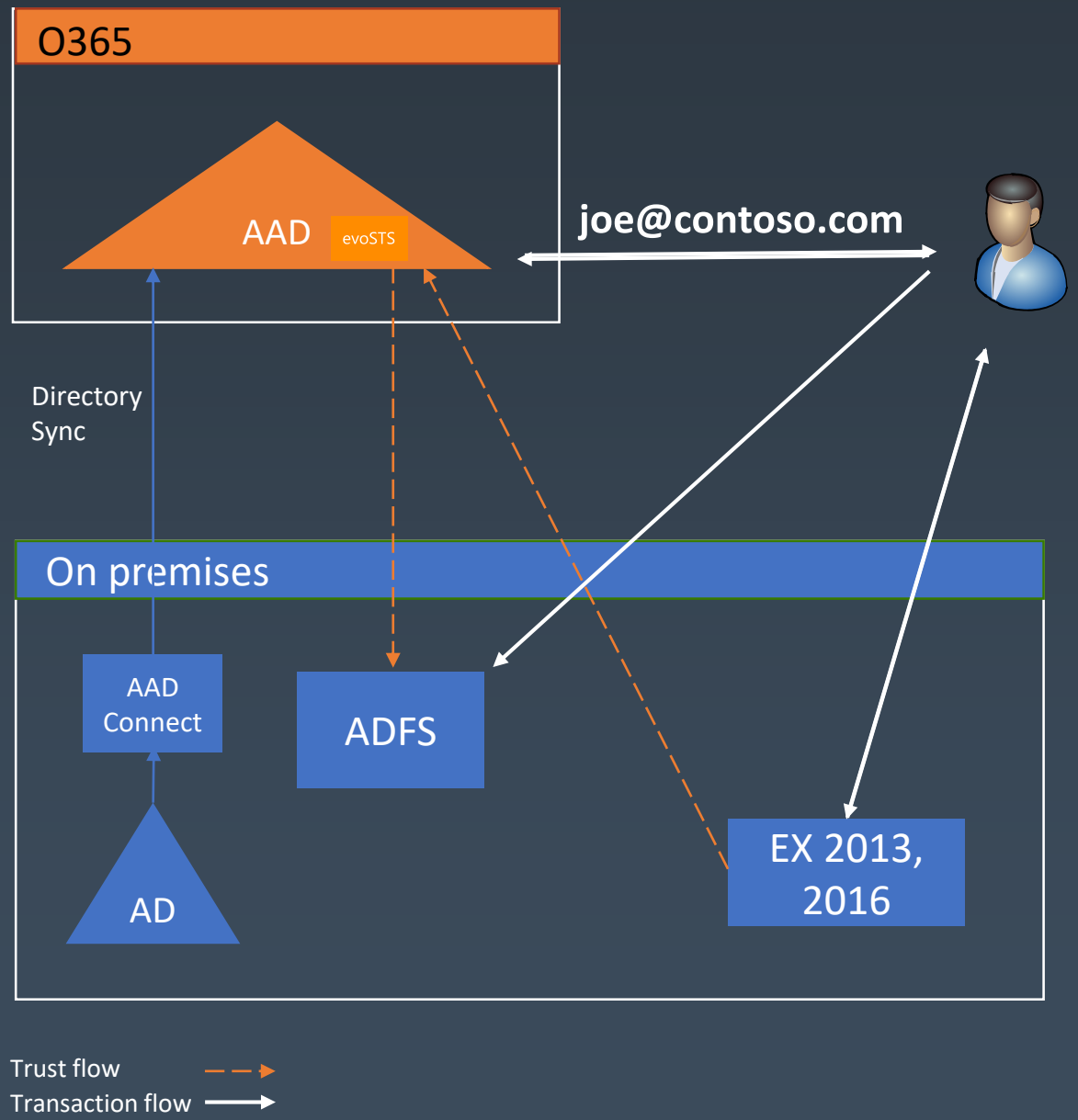
Outlook login (no cached tokens or Integrated Auth)

1. Client attempts to connect to Exchange
2. Exchange responds with “get token from AD FS”
3. Client connects to URI provided by Exchange
4. User provides username and password to AD FS
5. AD FS returns Access and Refresh tokens to Outlook
6. Client gives client Access token to Exchange on-prem

Hybrid Modern Auth (Coming in a future CU)

- Exchange 2013/16 must be Hybrid with O365 with Identity sync (Fed is not a requirement, password sync is fine)
- OAuth tokens come from AAD, AuthN can be done at AD FS
- Works with all MA capable clients supported with O365 and all 3rd party IDP's supported by O365
- Exchange HCW must be used to enable OAuth
- On-Prem SPN's need to be registered in AAD
- Same auth flow whether mailbox is on-prem or in the cloud

Hybrid Modern Auth – Federated Domain



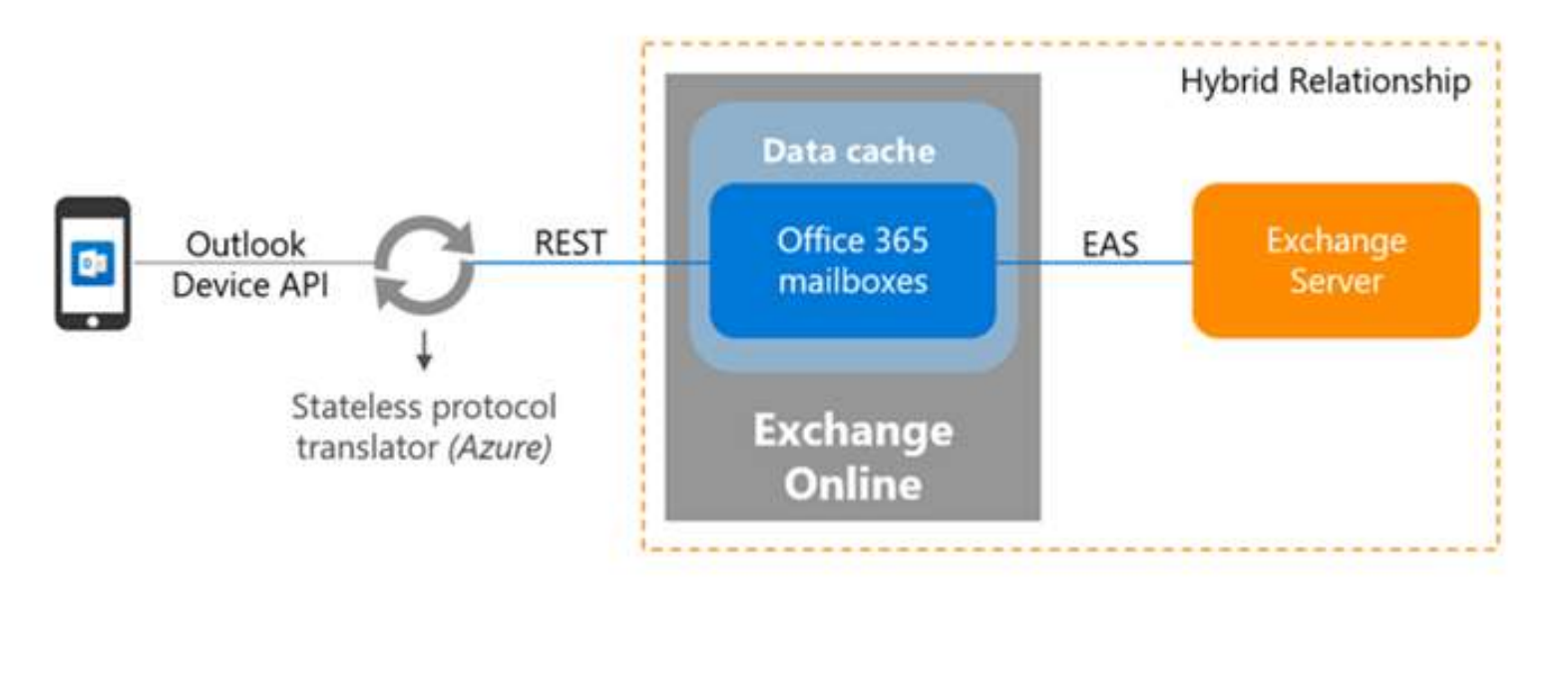
Outlook login (no cached tokens or Integrated Auth)

1. Outlook attempts to connect to Exchange
2. Exchange responds with “get token from AAD”
3. Outlook connects to URI provided by Exchange
4. User provides username to AAD
5. AAD redirects to on-prem AD FS
6. User enters password/certificate/drop of blood
7. AD FS redirects back to AAD
8. AAD returns Access and Refresh tokens to Outlook
9. Outlook gives client Access token to Exchange

Multi-Forest Hybrid?

- Each Exchange Organization must be authoritative for at least **one distinct SMTP namespace** and the corresponding Autodiscover namespace; A different public certificate must be used for TLS negotiation in each on-prem Exchange Organization
- If there are shared domains (e.g. @contoso.com) across multiple Exchange organizations, then both mail routing and Autodiscover needs to be configured and working properly between the Exchange orgs before you start
- Office 365 must be able to query Autodiscover in each org.
- Possible with Exchange 2010/2013/2016
- Latest version of HCW must be used!
- Free/busy is NOT transitive. Coex between on-premises orgs must be configured manually.
- You cannot go multi forest with multiple tenants

A new architecture for Exchange hybrid customers enables Outlook mobile and security



A new architecture for Exchange hybrid customers enables Outlook mobile and security

- Enterprise Mobility + Security support
- Fully powered by Microsoft Cloud
- OAuth protects users' passwords
- Provides Unique Device IDs
- Unlocks new features on iOS and Android:
  - Full Exchange Online search
  - Focused Inbox

https://blogs.technet.microsoft.com/exchange/2018/04/02/a-new-architecture-for-exchange-hybrid-customers-enables-outlook-mobile-and-security/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