

Munich



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Skype for Business

User Group Event



Skype for Business MEDIA BYPASS (CCE)

Work with



Unit Leader Sfb



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Microsoft
Most Valuable
Professional

MVP since 2012 +
Microsoft Sfb
Elite Team (Redmond)

Agenda

- Media Bypass overview
- Media Bypass CCE Design
- Configuring Media Bypass
- Further Information's

Media Bypass overview?

Why we needed Media Bypass with CCE?

- Direct path from clients to SBC
- Intelligent call routing with SBCs (later more)
- Improve voice quality (low latency)
- High call handling (volume of calls) – reduced system count

Question:

CCE + SBC or CCE Appliance?

Media Bypass CCE Design

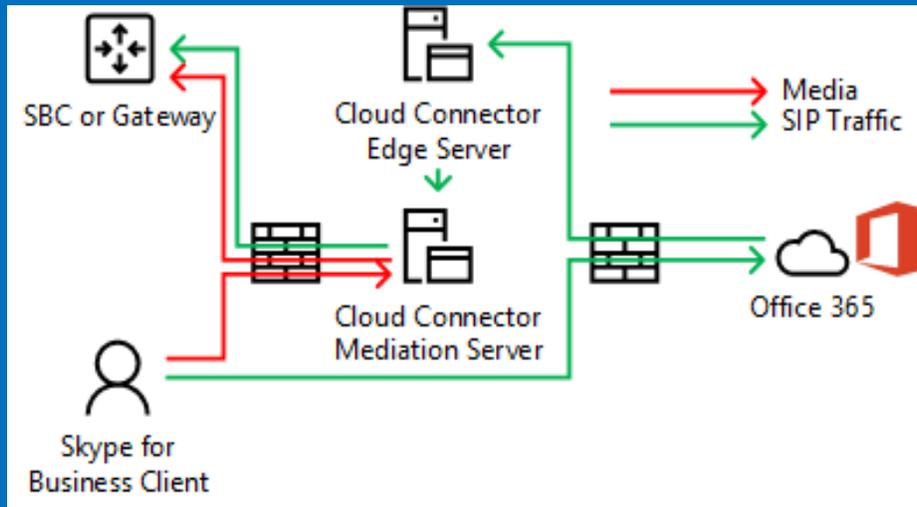
Network Considerations

How to plan your network for media bypass

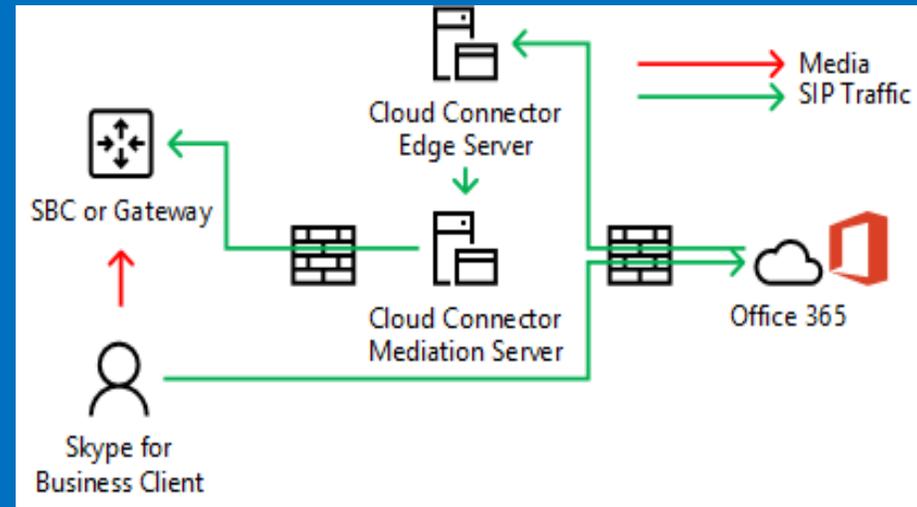
- When media bypass is enabled for a client, media will **always** bypass.
- External clients and unsupported clients will **never** use bypass.
- Requires unobstructed connectivity between clients and PSTN gateways.
- Media over VPN is not supported; block all SfB traffic from VPN!
- Media traffic between the client and the gateway typically uses G.711 codec.
 - For inbound calls, the client is the mediation server and mediation server will negotiate G.711
 - For outbound calls, the client is the SfB client and codec negotiated will depend on what Gateway offers client.

Generics Media Bypass overview

Without Media Bypass



With Media Bypass



G711 Media will traverse the WAN twice

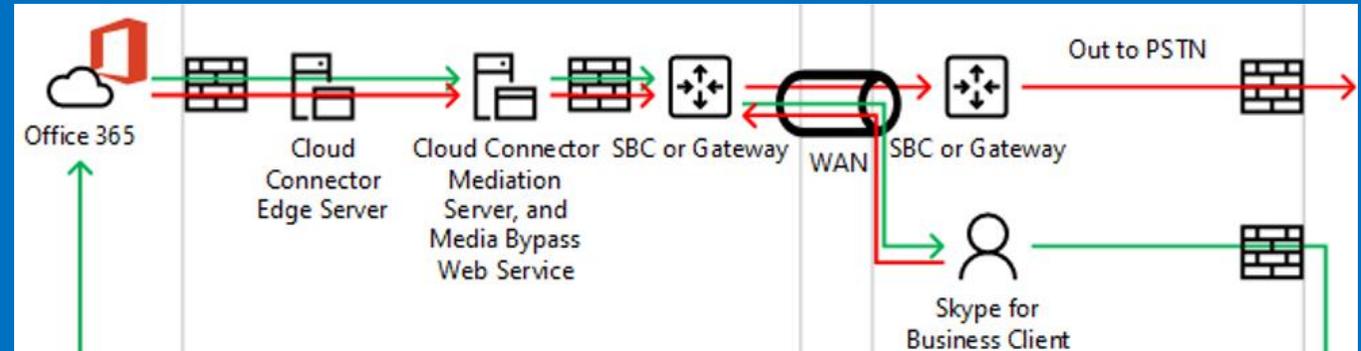
When CCE appliances are located in one central datacenter and

Local offices have local SBC/Gateway for ingress/egress of calls

Centralize SBC associated with CCE routes calls to local gateways

G711 Media will traverse WAN twice

1. From SfB client -> centralized SBC
2. From centralized SBC -> local SBC



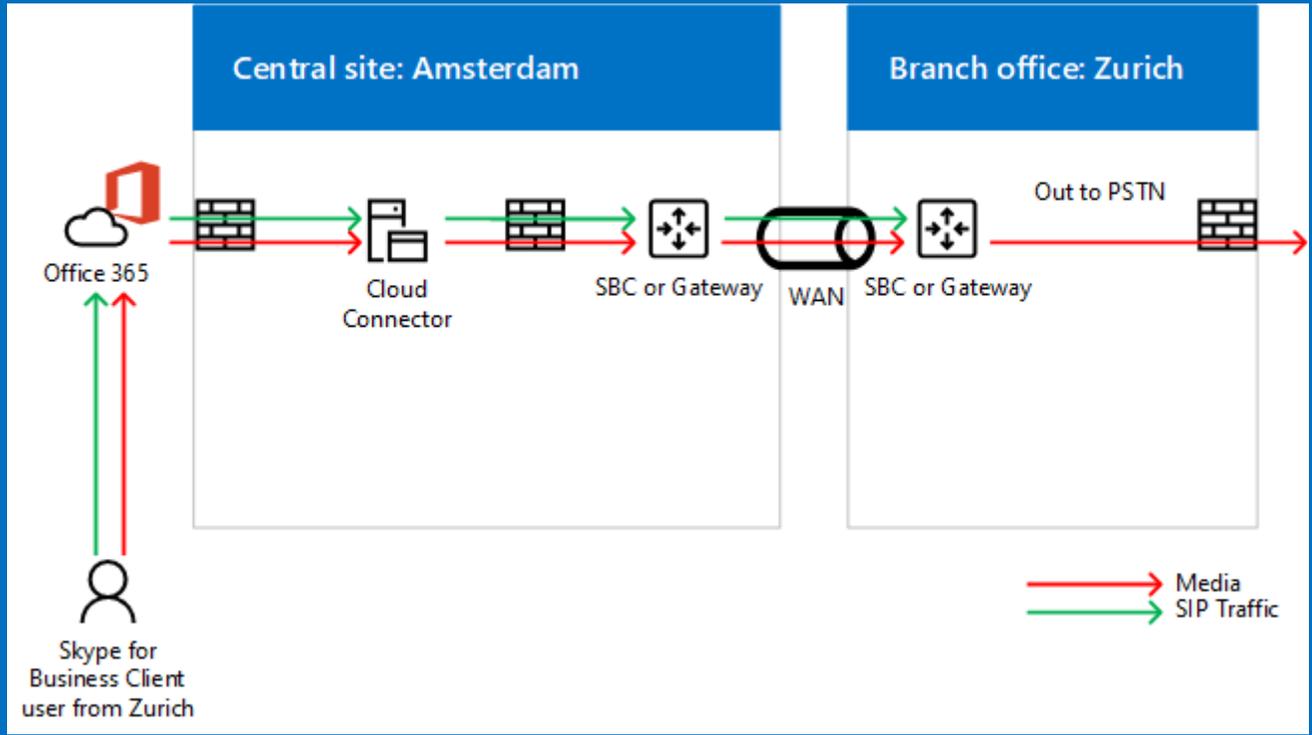
Centralized Deployment – External Caller

Media flow in centralized deployment for external users

User from Zurich is connected to external network

User places an outbound call

Signaling and media will flow over the WAN from central data center to branch office gateway



Design on White Board

Let me flip and draw for you

Configure Media Bypass

Cmd'let Media Bypass

PS C:\>

Command	comment
<code>Set-CsTenantHybridConfiguration</code>	Defines the parameter for CCE
<code>New-CsNetworkMediaBypassConfiguration</code>	Set Media Bypass options
<code>Set-CsNetworkConfiguration</code>	Writes the Media Bypass setting into the PSTNSite configuration

Configure Media Bypass (overview)

```
Set-CsTenantHybridConfiguration -HybridConfigServiceInternalUrl  
http://newname.domain/hybridconfig/hybridconfigservice.svc
```

```
$mediabypass = New-CsNetworkMediaBypassConfiguration -AlwaysBypass $true -Enabled $true
```

```
Set-CsNetworkConfiguration -MediaBypassSettings $mediabypass
```

Verify:

```
$show = (Get-CsNetworkConfiguration).MediaBypassSettings
```

Note:

There are possibilities with Media Bypass based on the networks (AlwaysBypass \$false -> Site, Region), which you can't configure in SfB Online yet.

Note:

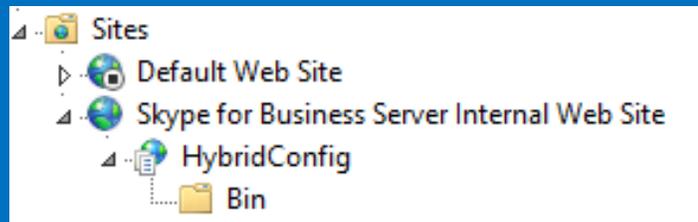
Newname.domain must point to the CCE Mediation Server! (internal) (and can be any name)

Port 80 must be open from internal Network to the CCE Mediation Server IP Address!

The URL is only queried once during LOGIN of the SfB client!

Mediation Server Web Service

Each CCE Mediation Server has a web service to provide media bypass information



Summary of steps to configure media bypass

- Administrator defines a URL to be used for the web service.
- Administrator creates a DNS Host A record in internal DNS service for this URL resolving to the IP address of each mediation server.
- Administrator enables media bypass using Skype for Business online PowerShell.
- Media bypass settings replicate to Cloud Connector mediation servers.
- Internal supported clients sign out and back in to pick up media bypass settings.

Win2016 Geo DNS

Create DNS policies that connect the client subnets to the matching zone scopes

<https://aka.ms/win2016geodns>

Create DNS entries for web service URL

- Create DNS records resolvable to **internal** clients
- Create Host A record resolving to IP of mediation server
- One Host A record needed for each mediation server deployed

Recommendation:

Use Geo DNS to resolve local mediation server IP's based on client location

Verify Tenant and CCE readiness

- Check the replication within your Office 365 tenant

```
Get-CsTenantHybridConfiguration -LocalStore
```

- Check the replication on you Mediation Server VM (on the CCE)

```
Get-CsNetworkConfiguration -LocalStore
```

Confirm Media Bypass – SfB Online

Confirm online bypass settings

- Sign into Remote PowerShell with Tenant Administrator credentials
- Confirm hybrid configuration web service URL replicated to local server store

```
Get-CsTenantHybridConfiguration -LocalStore | Select  
HybridConfigServiceInternalUrl  
HybridConfigServiceInternalUrl
```

```
http://hybridvoice.contoso.com/hybridconfig/hybridconfigservice.svc
```

Confirm media bypass settings replicated to local server store

```
Get-CsNetworkConfiguration -localstore | select -ExpandProperty  
MediaBypassSettings
```

```
Enabled : True  
InternalBypassMode : Any  
ExternalBypassMode : Any  
AlwaysBypass : False  
BypassID : 02ca0efb-2bb1-4bcc-a19a-d5cb1aa3e914  
EnabledForAudioVideoConferences : False
```

Confirm Media Bypass – On CCE

Confirm CCE mediation server bypass settings

- Open Administrative PowerShell on each CCE mediation server and run:

```
Get-CsNetworkConfiguration -localstore | select -ExpandProperty  
MediaBypassSettings  
Enabled : True  
InternalBypassMode : Any  
ExternalBypassMode : Any  
AlwaysBypass : True  
BypassID : 02ca0efb-2bb1-4bcc-a19a-d5cb1aa3e914  
EnabledForAudioVideoConferences : False
```

Notes:

- In V2, the **BypassID** will be the same for all CCE deployments in all tenants.
- CCE Mediation server configured with **AlwaysBypass=True**; not synchronized from online

Performance Monitor

- Configure Performance Monitor on CCE Mediation server to monitor the following:
 - LS:MediationServer – Inbound Calls – Total inbound media bypass calls
 - LS:MediationServer – Outbound Calls – Total outbound media bypass calls
- This works well for basic inbound and outbound calls, but won't capture statistics on more complex calling scenarios like transfers between internal and external calls.

Show	Color	Scale	Counter	Instance	Parent	Object	Computer
<input checked="" type="checkbox"/>	Red	1.0	- Active media bypass calls	_Total	---	LS:MediationServer - Inbo...	\\MTMS01
<input checked="" type="checkbox"/>	Green	1.0	- Total inbound media by...	_Total	---	LS:MediationServer - Inbo...	\\MTMS01
<input checked="" type="checkbox"/>	Blue	1.0	- Active media bypass calls	_Total	---	LS:MediationServer - Out...	\\MTMS01
<input checked="" type="checkbox"/>	Yellow	1.0	- Total outbound media ...	Total	---	LS:MediationServer - Out...	\\MTMS01

Last: 3.000 Average: 3.000 Minimum: 3.000 Maximum: 3.000 Duration: 1:40

Network Tracing

- Use Network Capture to capture network activity for calls apply a filter to view traffic between the client IP and the PSTN Gateway.
- When media bypass **enabled**, you will see traffic between the client and the Gateway. (See below – Client .123, and Gateway is .8)
- When media bypass is **disabled**, you will not see traffic between the client and the Gateway.

MessageNumber	Timestamp	TimeElapsed	Source	Destination	Module	Summary
1450	2017-07-09T08:17:39.8662871		10.10.10.123	10.10.10.8	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha ^
1454	2017-07-09T08:17:39.8866396		10.10.10.123	10.10.10.8	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha
1456	2017-07-09T08:17:39.9032662		10.10.10.8	10.10.10.123	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha
1457	2017-07-09T08:17:39.9085638		10.10.10.123	10.10.10.8	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha
1458	2017-07-09T08:17:39.9225896		10.10.10.8	10.10.10.123	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha
1459	2017-07-09T08:17:39.9264106		10.10.10.123	10.10.10.8	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha
1460	2017-07-09T08:17:39.9417868		10.10.10.8	10.10.10.123	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha
1461	2017-07-09T08:17:39.9470501		10.10.10.123	10.10.10.8	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha
1462	2017-07-09T08:17:39.9629184		10.10.10.8	10.10.10.123	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha
1463	2017-07-09T08:17:39.9663290		10.10.10.123	10.10.10.8	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha
1464	2017-07-09T08:17:39.9827441		10.10.10.8	10.10.10.123	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha
1465	2017-07-09T08:17:39.9862413		10.10.10.123	10.10.10.8	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha
1466	2017-07-09T08:17:40.0027918		10.10.10.8	10.10.10.123	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha
1467	2017-07-09T08:17:40.0062822		10.10.10.123	10.10.10.8	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha
1468	2017-07-09T08:17:40.0224556		10.10.10.8	10.10.10.123	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha
1469	2017-07-09T08:17:40.0261880		10.10.10.123	10.10.10.8	RTP	PayloadType: G722 Audio, 8000Hz [1 Cha v

Tracing Logs

Search for a=x-bypass in the messages tab.

In Mediation server tracing, there should be 3 items per call:

1. Invite: SDP will show two occurrences of
`a=x-bypassid:2cd1a522-b9c5-4410-8aed-f3eca85eb367`
2. 183 Session Progress: SDP will show
`a=x-bypass`
3. 200 OK: SDP will show
`a=x-bypass`

Additionally, the VQReport in client will show

`<MediationServerBypassFlag>true</MediationServerBypassFlag>`



Some Links and further infos

Media Bypass Technet

<https://technet.microsoft.com/en-us/library/gg425718.aspx>

<https://technet.microsoft.com/en-us/library/gg398927.aspx>

<https://technet.microsoft.com/en-us/library/gg398365.aspx>

Further Information & Design Discussion (white board)

Useful Info's and Links

- CCE and Media Bypass
 - <https://technet.microsoft.com/en-us/library/mt808733.aspx><https://technet.microsoft.com/en-us/library/mt605227.aspx>
 - **Plan:** <https://technet.microsoft.com/en-us/library/mt808733.aspx>
 - **Deploy:** <https://technet.microsoft.com/en-us/library/mt808734.aspx>
- My Blog and Technet Gallery links
 - www.uclabs.blog
- Skype Operations Framework
 - <http://skypeoperationsframework.com>
- Skype Academy
 - <http://skypeoperationsframework.com/academy>
- Skype Preview
 - <http://skypepreview.com>

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