AudioCodes One Voice for Microsoft[®] 365

CloudBond[™] 365

Partner Guidelines for Verifying Third-Party Applications



Table of Contents

1	General Description	7
2	CloudBond 365 Hardware Platform	9
3	CloudBond 365 Application Building Blocks	11
	3.1 CloudBond 365 Available ABBs	12
4	Responsibility	13
	4.1 CloudBond 365 Backup and Restore	13
5	Test Network Environment	15
6	Skype for Business Server Stress and Performance Tool	17
7	Preparing the Test Environment	19
	7.1 Preparing CloudBond 365	19
	7.2 Downloading Pre-defined Load Test Files	19
	7.3 Configuring the Test Environment	19
8	Add Your Application to CloudBond 365	27
9	Starting the Load Test	29
10	Collecting Key Health Indicators	33



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1 General Description

AudioCodes CloudBond[™] 365 is a modular, adaptable solution for data centers, customer premises and branches. A versatile all-in-one Microsoft Skype for Business appliance designed for hybrid environments, it combines the best of Skype for Business Server, Phone System in Office 365 (formerly known as Cloud PBX) and the service provider's voice services.

The CloudBond 365 family offers a selection of models for different scales, capacities and deployment typologies. CloudBond 365 enables PSTN/SIP trunk connectivity services for Skype for Business Online as well as for future Microsoft Teams.

Partner and integrators may host additional third-party applications on top of CloudBond 365 within predefined virtual machines called Application Building Blocks.

This document guides partners on how to prepare the CloudBond 365 environment for testing, how to run the load, and how to analyze the results.



Important: AudioCodes does not take any responsibility for the specifications and performance of third-party applications running on the CloudBond 365 platform.



2 CloudBond 365 Hardware Platform

Currently, there are three hardware platforms for CloudBond 365 which are relevant when adding third-party applications:

CloudBond 365 Standard Plus Edition:

- Capacity for up to 200 users
- Skype deployment combined with Gateway and SBC functionality
- Skype Standard Edition with SQL Server and Windows Server and Reverse Proxy
- Additional virtual machine for trusted applications

CloudBond 365 Pro Edition:

- Capacity for up to 500 users
- Skype deployment combined with Software SBC functionality
- Skype Standard Edition with SQL Server, Windows Server and Reverse Proxy
- Additional virtual machine for trusted applications

CloudBond 365 Enterprise Edition:

- Capacity for up to 5,000 users (Media Bypass only)
- Skype deployment combined with Software SBC functionality
- Skype Standard Edition with SQL Server, Windows Server and Reverse Proxy
- Additional virtual machine for trusted applications



3 CloudBond 365 Application Building Blocks

The available resources on CloudBond 365 appliance vary per platform and user count. Three Application Building Blocks (ABB) sizes can be defined:

- Small (ABB1)
- Medium (ABB2)
- Large (ABB3)

A combination of ABBs is also possible within available resources.

Trusted Application boundaries must be defined per ABB by the vendor, based on Microsoft Skype for Business Stress and Performance Tool.

The same ABB on different hardware platforms provide different results due to differences in CPU, disk and cache size.

Before starting the test process, vendors must define which ABB and CloudBond 365 platform is designated for testing and must follow the rule that if the application is approved on ABB on CloudBond 365 Pro or Enterprise Edition, it is approved only on these two platforms and not on the Standard Plus platform. However, one the other hand, in the event where it is approved on the Standard Plus platform, it is also automatically approved on the Pro and Enterprise Editions as well.

The figure below illustrates the CloudBond 365 ABB specifications.

Figure 3-1: CloudBond 365 Application Building Blocks (ABB)

	Туре	Specifications on Standard+	Specifications on Pro & Enterprise
000	Small	2-cores 4 GB memory 40 GB hard disk space	1-core 4 GB memory 40 GB hard disk space
deces	Medium	Not available	2-cores 4 GB memory 80 GB hard disk space
33636	Large	Not available	4-cores 8 GB memory 120 GB hard disk space

3.1 CloudBond 365 Available ABBs

The table below lists CloudBond 365 available ABBs.

Table 3-1: CloudBond 365 Available ABBs

CloudBond 365 Edition	Max. Users	CloudBond 365 Configuration SRV: Type/CPU/MEM	ABB Options
CloudBond 365 Standard Plus	200	 Host(DC) VM1: FE/4/10G VM2: Edge/4/8G VM2: RP/4/4G 	1 x ABB1
CloudBond 365 Pro	200	 Host(Hyper-V) VM1: DC/2/4G VM2: FE/3/10G VM3: Edge/2/8G VM4: RP/2/2G VM5: SBC/1/4G 	1 x ABB1 1 x ABB2
CloudBond 365 Pro	500	 Host(Hyper-V) VM1: DC/2/4G VM2: FE/3/10G VM3: Edge/2/8G VM4: RP/2/2G VM5: SBC/1/4G 	1 x ABB11 x ABB2
CloudBond 365 Enterprise	500	 Host(Hyper-V) VM1: DC/2/4G VM2: FE/3/10G VM3: Edge/2/8G VM4: RP/2/2G VM5: SBC/1/4G 	 4 x ABB1 3 x ABB2 1 x ABB3 Combination of ABB1/2/3
CloudBond 365 Enterprise	1000	 Host(Hyper-V) VM1: DC/2/8G VM2: FE/5/20G VM3: Edge/3/16G VM4: RP/2/2G VM5: SBC/1/4G 	 3 x ABB1 2 x ABB2 1 x ABB3 Combination of ABB1/2/3
CloudBond 365 Enterprise	2500	 Host(Hyper-V) VM1: DC/2/8G VM2: FE/8/20G VM3: Edge/3/16G VM4: RP/2/2G VM5: SBC/1/4G 	 2 x ABB1 1 x ABB2



Note: The Microsoft Hyper-V virtual machines resources (CPU/Memory) must be set according to the number of users.

4 **Responsibility**

AudioCodes is responsible for performing load testing on CloudBond 365 according to the profile detailed in Chapter 9 and for defining the free resources (available ABBs) per CloudBond 365 Appliance according to user count.

The Partner is responsible for preparing the test environment and performing combined load testing on CloudBond 365 and on its application, and for defining the supported setup when hosted by CloudBond 365.

Partners may define new profiles in case they are more suitable for its application usage. In this case, a note must be added regarding the relevant profiles.



Note: Do not use the Microsoft SQL Servers (Standard Edition and SQL Server Express) that are pre-installed on CloudBond 365 without AudioCodes approval.

4.1 CloudBond 365 Backup and Restore

CloudBond 365 provides full backup and restore capability (customer-ordered feature). If you do employ this capability, to back up the entire CloudBond 365 including the ABBs, you must run backup and restore tests that include the entire CloudBond 365 and the vendor applications.



5 Test Network Environment

The network environment for load testing is designed as shown in the following figure.



Figure 5-1: Load Testing Network Environment Block Diagram

The upper three servers (TESTCLIENT0-2) will run on different hardware (physical or virtual) and will perform the load testing. The Partner is responsible for installing the Windows operating system (Windows 2012 R2) and for loading tools on these servers according to the instructions in Chapter 7.

The hardware requirements for the test servers include the following:

- TESTCLIENT0: 8 cores, 12G RAM
- **TESTCLIENT1:** 8 cores, 12G RAM
- **TESTCLIENT2:** 4 cores, 8G RAM



6 Skype for Business Server Stress and Performance Tool

The Skype for Business Server 2015 Stress and Performance Tool is used to perform load testing on the environment and can be downloaded from <u>https://www.microsoft.com/en-us/download/details.aspx?id=50367</u>. Full information on performance testing is available at <u>https://technet.microsoft.com/en-us/library/mt631400.aspx</u>.

During the load from the Skype for Business Server 2015 Stress and Performance Tool, Key Health Indicators (KHI) are collected from the following three servers being tested:

- Host server running the virtual machines (UC-HOST.cloudbond365.local)
- Skype for Business Server 2015 Front End Server (UC-FE.cloudbond365.local)
- Skype for Business Server 2015 Edge Server (UC-EDGE.cloudbond365.local)

The KHI Performance Monitor Data Collector sets are provided by Microsoft as part of the "Key Health Indicators for Lync Server 2013 and Skype for Business Server 2015", which can be downloaded from <u>https://www.microsoft.com/en-</u> us/download/details.aspx?id=46895.



7 **Preparing the Test Environment**

This chapter describes how to prepare the test environment.

7.1 **Preparing CloudBond 365**

A CloudBond 365 system is already installed as a standalone system when shipped from AudioCodes, with the same IP addresses as shown in Figure 5-1 and is ready for use.

The Hyper-V Virtual machines resources (CPU/Memory) must be set according to the number of users and CloudBond 365 platform, as shown in Table 3-1.

In the event of re-imaging the CloudBond 365 system, run the installation again. The default options will create the CloudBond 365 as received from production. Follow the step-by-step instructions described in the CloudBond 365 documentation for the re-image and re-install process:

https://www.audiocodes.com/library/technicaldocuments?productFamilyGroup=1655&productGroup=8540

If you need to make changes (not recommended), for example, to the IP address, certificate, and SIP domain, refer to the CloudBond 365 documentation for full instructions.

7.2 Downloading Pre-defined Load Test Files

Download the pre-defined load-test files from here.

7.3 Configuring the Test Environment

Follow the instructions below for configuring the test environment.

- > To configure the test environment:
- Make sure that the Time, Date and Time-Zone on the servers under testing match the actual time. This verification prevents related authentication and certificate issues. Make sure that you are using the latest CloudBond 365 version, which can be downloaded from <u>http://downloads-audiocodes.s3.amazonaws.com/Download/UMP365_IW.html</u>.
- Connect the CloudBond 365 to the network. Note that there are two NICs -- one for LAN and one for DMZ. (Refer to the CloudBond 365 manual to determine the correct NIC position according to the CloudBond 365 platform.)
- 3. Join the TESTCLIENT0, TESTCLIENT1 and TESTCLIENT2 servers to the CloudBond365.local domain (the server under test) so that the stress test clients trust the certificate authority that is used within the network and query the same DNS server for name resolution.

	Active Directory Users and Computers	_ 0 ×
File Action View Help		
🗢 🄿 🙍 🖬 📋 🖾 🧔		
Active Directory Users and Com Active Directory Users and Com Saved Queries Coudbond365.local Builtin Computers Gometers	Name Type Description TESTCLIENT0 Computer TESTCLIENT1 Computer UC-FE Computer	
	•	

Figure 7-1: Active Directory Users and Computers

- Install the Skype for Business Server 2015 Stress and Performance Tool on TESTCLIENT0, TESTCLIENT1 and TESTCLIENT2 servers, by running the CapacityPlanningTool.msi application (<u>https://www.microsoft.com/en-us/download/details.aspx?id=50367</u>).
- 5. Log in with domain administrator credentials.
- 6. Turn off the Windows Firewall on TESTCLIENT2.
- 7. Add all required DNS records to the DNS server running on 192.168.0.101 (UC-MGR.cloudbond365.local), as shown below. Add all TESTCLIENT machines as well.

Cinuma 7.0. DNC Manager

Figure 7-2. Divo Manager						
å		DNS Mar	ager			- 0 ×
File Action View Help						
🗢 🄿 🙍 📰 🖾 🐼						
 DNS UC-MGR Global Logs Forward Lookup Zones , msdcs.cloudbond365.local , cloudbond365.local , cloudbond365.local , clop , tcp , tcp , tcp , tcp , tcp , try Reverse Lookup Zones Reverse Lookup Zones Conditional Forwarders 	Name msdcs sites tcp tts DomainDnsZones ForestDnsZones (same as parent folder) (same as parent folder) (same as parent folder) edgepool Gateway lyncdiscoverinternal meet sip UC-Edge UC-FE UC-Host UC-FR UC-RP lyncdiscover ewslync	Type Start of Authority (SOA) Name Server (NS) Host (A) Host (A)	Data [51], uc-mgr.cloudbond36 uc-mgr.cloudbond365.loc 192.168.0.101 192.168.0.102 192.168.0.102 192.168.0.102 192.168.0.103 192.168.0.103 192.168.0.101 192.168.0.101 192.168.0.101 192.168.254.104	Timestamp static static 5/24/2017 11:00:00 AM static	nte Windows	Panel to

- 8. Add the following domain resolving to the hosts file on TESTCLIENT0 and
 - 192.168.254.103

TESTCLIENT1:

sip.cloudbond365.local

- **9.** Verify there is a successful ping from the TESTCLIENT machines to both the Front End (192.168.0.102) and the Edge (192.168.254.103) servers.
- Install the Skype for Business Server 2015 Stress and Performance Tool on the Front End server (UC-FE.cloudbond365.local / 192.168.0.102), by running the CapacityPlanningTool.msi application (<u>https://www.microsoft.com/en-us/download/details.aspx?id=50367</u>).

11. Using the Skype for Business Topology builder, add a default gateway to the Skype for Business topology, pointing to 192.168.0.20 (TESTCLIENT2, which will be used to simulate PSTN calls).

5	
File Action Help	
 A CS 2015 ACS 2015 Lync Server 2010 Lync Server 2013 Skype for Business Server 2015 Standard Edition Front End Servers Enterprise Edition Front End pools Director pools Mediation pools Persistent Chat pools Edge pools Trusted application servers Video Interop Server pools Shared Components SQL Server stores File stores 	The properties for this item are not available for editing.
PSTN gateways	
Trunks New IP/PSTN Ga	iteway
Office Web Topology	Define a new IP/PSTN gateway.
Video gate Help III Video tranks	
Branch sites	

Figure 7-3: Skype for Business Topology Builder

Figure 7-4: Define PSTN Gateway FQDN

Define New IP/PSTN Gateway
Define the PSTN Gateway FQDN
Define the fully qualified domain name (FQDN) for the PSTN gateway. FODN: *
192.168.0.20
Help Back Next Cancel

5	Define New IP/PSTN Gateway	x
۰	Define the IP address	
 Enable I Use Limi PST 	IPv4 all configured IP addresses. it service usage to selected IP addresses. N IP address:	
○ Enable I ● Use ○ Limi PST	IPv6 all configured IP addresses. it service usage to selected IP addresses. N IP address:	
Help	Back Next Cancel	

Figure 7-5: Define the IP Address

Figure 7-6: Define the Root Trunk

8	Define New IP/PSTN Gateway
5	Define the root trunk
Trunk na	me: *
192.168	.0.20
Listening 5068	port for IP/PSTN gateway: *
SIP Trans	port Protocol:
TCP	▼
Associate	ed Mediation Server:
UC-FE.c	loudbond365.local ACS 2015 🔹
Associate	ed Mediation Server port: *
5060	
Help	Back Finish Cancel

- **12.** When finished, publish the topology and wait for replication to complete on all servers.
- 13. On the Front End server, open an elevated PowerShell Window (administrator mode) with an account that is a member of the required Skype for Business Security Groups. The default account is cloudbond365\Administrator with password R3m0t3Supp0rt.
- 14. To prepare the Skype for Business Server environment for the tests, start the following PowerShell Scripts in the order listed from C:\Program Files\Skype for Business Server 2015\LyncStressAndPerfTool\Doc\:
 - a. .\ArchivingPolicy.ps1
 - **b.** .\MeetingPolicy.ps1
 - c. .\ContactsPolicy.ps1
 - d. .\FederationPolicy.ps1
 - e. .\BandwidthPolicy.ps1
 - f. .\RoutingRules.ps1
 - g. .\ConferenceAutoAttendantConfiguration.ps1
 - h. .\CallParkConfiguration.ps1

15. Start the UserProvisioningTool.exe application from C:\Program Files\Skype for Business Server 2015\LyncStressAndPerfTool\LyncStress\" to prepare the users, contacts and distribution lists that are used during the test, by filling out the information as shown below and clicking the specific Create buttons. Alternatively, load the create_5000_users.xml that is supplied (Configuration > Load Configuration) and then change the number of users to suit your test needs.

0 /1					
🖳 Skype for Business Server 2015	5 Stress Test - User Provisioning T 🗕 🗖 🗙				
Configuration					
User Creation Contacts Creation Distribution	ution List Creation Location Info Service Config				
Front-End Pool FQDN	UC-FE.cloudbond365.local				
User Name Prefix	testuser				
Password	P@ssw0rd				
SIP Domain	cloudbond365.local				
Account Domain	cloudbond365.local				
Organizational Unit	TestUsersOrgUnit				
Phone Area Code	+1425 Voice Enabled				
Number of Users	5000 🔹 Start Index 0 🗘				
Create Users Delete Users					

Figure 7-7: Skype for Business Stress Test- User Creation

Figure 7-8: Skype for Business Stress Test-Contacts Creation

🖳 Skype for Business Server 2015 Stress Test - User Provisioning T 🗕 🗖 🗙						
Configuration						
User Creation Contacts Creation	istribution List Creation Loc	ation Info Service Config				
Average Contacts per Us	ser	50 🔹 🗹 Fixed				
Average Contact Groups	per User	5				
Federated / Cross Pool C	Contacts Percentage	0				
Federated / Cross Pool U	Federated / Cross Pool User Prefix					
Federated / Cross Pool U	fabrikam.com					
	Create Contacts					

🖳 Skype for Business Server 2015 Stress Test - User Provisioning T	D X
Configuration	
User Creation Contacts Creation Distribution List Creation Location Info Service Config	
Number of Distribution Lists 100	
Minimum Members in a Dist. List 1	
Maximum Members in a Dist. List 10	
Create Distribution Lists	

Figure 7-9: Skype for Business Stress Test- Distribution List Creation

16. Under the Location Info Service Config tab, enter the details, and then click Generate LIS Config Files:

Figure 7-10: Location Info Service Config

Skype for Busines Configuration	s Server 2015 Stress	Test - User Provisio	oning T – 🗆 🗙
User Creation Contacts	Creation Distribution List	Creation Location Info Se	
Number of Address	es 100 🚖	Number of Subnets	s 100 🗘
Offices Per Address	s 100 🚔	Number of Switche	s 100 韋
Number of WA Point	nts 100 🗘	Number of Ports	100 🚖
Civic Address Details			
Company Name	Microsoft	City	Redmond
Street Name	One Microsoft Way	State	WA
Street Name Suffix		Zip Code	98052
Post Directional		Country United	United States
	Generate L	IS Config Files	

- 17. Copy the C:\Program Files\Skype for Business Server 2015\LyncStressAndPerfTool\Doc\LisConfiguration.ps1 file to the C:\Program Files\Skype for Business Server 2015\LyncStressAndPerfTool\LyncStress folder, and then run it from this location using PowerShell in elevated mode (.\LisConfiguration.ps1).
- **18.** Open the file ResponseGroupConfiguration.ps1 from *C:\Program Files\Skype for Business Server 2015\LyncStressAndPerfTool\Doc* to fix the \$agentPrefix, matching the User Name Prefix as defined in the User Provisioning Tool:

Figure 7-11: ResponseGroup Configuration

ResponseGro	pupConfiguration.ps1 🗙
1 ### 2 # T 3 # S 4 # T 5 # S 6 # a 7 # S 8 # S	######################################
9 # 10 # T 11 ### 12	he script is provided "as is" without any warranties or guarantees.
13 Imp 14 15 \$d 16 \$h= 17 \$m= 18 \$s	= Get-Date \$d.Hour \$d.Minute = \$d.Second
19 Sta 20 21 # t 22 \$ag	rt-Transcript -Verbose -Path: ResponseGroupConfiguration\$h\$m\$s.txt he prefix of the user in the pool entPrefix = " <mark>contosouser</mark> "

- **19.** Change "contosouser" to "testuser".
- **20.** From C:\Program Files\Skype for Business Server 2015\LyncStressAndPerfTool\Doc, run the .\ResponseGroupConfiguration.ps1 script using PowerShell in elevated mode.



8 Add Your Application to CloudBond 365

The Partner's application runs on a separate virtual machine. Using the Hyper-V Manager, create the extra virtual machine and allocate the resources according to ABB specifications that you wish to test and which is available on the CloudBond 365 platform that you are testing. Configure your application to run the load as shown in Figure 3-1.



9 Starting the Load Test

Make sure the test clients are prepared according to the documentation, which includes installing the Skype for Business Server 2015 Stress and Performance Tool on every client and registering the following two DLLs manually (which can only be done after the \Setup\amd64\vcredist_x64.exe from the Skype for Business Server DVD has been installed):

- regsvr32.exe /i /n /s 'C:\Program Files\Skype for Business Server 2015\LyncStressAndPerfTool\LyncStress\LyncPerfToolPerf.dll'
- regsvr32.exe /i /n /s 'C:\Program Files\Skype for Business Server 2015\LyncStressAndPerfTool\LyncStress\S4Perf.dll'

Run the load test for the relevant number of users defined in the Skype for Business User Profile:

```
Voice Conference=10%,
Video Conference=0%
IM conference=10%
PSTN calls=10%,
VoIP (C2C) calls=10%
Contacts per user=50
External (Edge) users=25%
```

To start the load test:

- 1. Copy the pre-defined load-test files provided by AudioCodes to the corresponding test server (it is recommended to copy these files under the LyncStress folder):
 - For 200/500/1,000 users, there are two load-test folders:
 - client0_all should be run from TESTCLIENT0
 - client1_pstn should be run from TESTCLIENT2
 - For 2,500 users, there are three load-test folders:
 - client0_all should be run from TESTCLIENT0
 - client1_all should be run from TESTCLIENT1
 - client2_pstn should be run from TESTCLIENT2
- 2. Start the load by issuing the .\RunClient<bat_filename>.bat "C:\Program Files\Skype for Business Server 2015\LyncStressAndPerfTool\LyncStress" command from the location where the files are copied:

Figure 9-1: Stress Test Client Roles on Training Host





3. Verify that the endpoints register successfully using the performance monitor application with the LyncPerfTool–General information counters on the client0 and client1:

	J		
- 理	Stress Test Client 0 All Roles on TRAINING-HOST - Virtual Machine Con	nection	- - ×
File Action Media Clipboard Vie	ew Help		
🕸 🔘 🗩 🞯 🔘 📗 🖡	ち 肉		
			x
	Performance Monitor		
No File Action View Window	v Help		_ 6 ×
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Performance			^
A Monitoring Tools			
Performance Monitor			
Data Collector Sets	\\TESTCLIENTO	.	
Reports	LyncPerf Lool: - General Information	_lotal	
	Lyncrerfiool - Latency for the last login (registration+presence) in milliseconds	1 727 000	
	LyncPerfTool - Total Active Endpoints	734.000	
	LyncPerfTool - Total Endpoints Disconnected	743.000	
	LyncPerfTool - Total Endpoints Disconnected Due to Session Timeout	0.000	
	LyncPerfTool - Total Failed Logons	0.000	
	LyncPerfTool - Total Logon Attempts	1,953.000	
	Lyncrerriooi - Totai Time Spent in Minutes	950.000	E
- 12	Stress Test Client 0 All Roles on TRAINING-HOST - Virtual Machine Con	nection	
File Action Media Clipboard Vie	ew Help		
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			x
	Performance Monitor		
	renonnance monitor		
No File Action View Window	v Help		_ 6 ×
🚺 🗶 🖚 🖄 📰 📰 📾 👔 👔			
Performance	🕅 🕋 🔜 🚽 🚜 💙 🏄 🐘 🖆 🥅 💼 🚺 💵 🛯		^
🖌 🖌 🔚 Monitoring Tools			
Performance Monitor			
Data Collector Sets	\\TESTCLIENTO	Tetel	
Reports	Lyncren Look - General Information	_10tal 738.000	
	LyncPerfTool - Latency for the last login (registration+presence) in milliseconds	1.727.000	
	LyncPerfTool - Total Active Endpoints	734.000	
	LyncPerfTool - Total Endpoints Disconnected	743.000	
	LyncPerfTool - Total Endpoints Disconnected Due to Session Timeout	0.000	
	typettertteet letelleiled lesens	0.000	
< Comparison of the second sec	LyncPertTool - Total Logon Attempts	1 052 000	
	LyncPerfTool - Total Logon Attempts LyncPerfTool - Total Ling Spent in Minutes	1,953.000	

Figure 9-2: Performance Monitors

=

Total Failed Logons should be 0.

LyncPerfTool-PSTN GW Info on testclient2 should show active PSTN calls.

Figure 9-3: Incoming PSTN Calls Established and Outgoing PSTN Calls Established.



- 4. Run the load tests on your application and validate that it is successfully loaded.
- 5. Perform testing with actual Skype clients (calls, conferences, and change presence). Verify that there are no significant delays in response time, call delay, voice quality and conference quality with maximum load.

These test results provide one of the important indications that the system can support the required load.



10 Collecting Key Health Indicators

Due to the fact that a huge load is generated at the startup of the test process, it is best to wait 60 minutes before capturing Key Health data. This will prevent false negatives like the Conference Mcu Allocator Max shown below from appearing in the data, which is caused by too many simultaneous registration actions upon startup.

Figure 10-1: Counters Pivot Table

Counters Pivot Table						
Counter Name \ Counter Instance \ Server Name	T Counter Date	КНІ	Min	Max	Avg	# Burst
□\LS:USrv - Conference Mcu Allocator\USrv - Create Conference	Latency (msec)					
LS:USrv - Conference Mcu Allocator						
			0.00	12,421.50	154.10	1
□\PhysicalDisk(*)\Avg. Disk sec/Read						
PhysicalDisk(_Total)						
			0.00	0.16	0.02	21
PhysicalDisk(0 C:)						
. UC-FE			0.00	0.16	0.02	21

To start the KHI collector sets:

- 1. Copy the *Create_KHI_Data_Collector.ps1* file (part of "Key Health Indicators for Lync Server 2013 and Skype for Business Server 2015": https://www.microsoft.com/en-us/download/details.aspx?id=46895) to the Host, Front End and Edge Server.
- 2. Run this file from PowerShell in an elevated window, with the parameter -version Skype4B, as shown below. Once the collector set is created, start logging with the command: logman start KHI.

Figure 10-2: Edge on UC-HOST

2	Edge on UC-HOST - Virtual Machine Connection
File Action Media Clipboard View Help	
🏂 C 💰 41 🔢 🕲 🖲 🕥 🕼	
Ad	ministrator: Windows PowerShell
Windows PowerShell Copyright (C) 2014 Microsoft Corporation. All r	ights reserved.
PS C:\Users\Administrator> cd C:\KHI_collector PS C:\KHI_collector> .\Create_KHI_Data_Collecto Creating KHI Data Collector on UC-EDGE. The command completed successfully. PS C:\KHI_collector> Logman start KHI The command completed successfully. PS C:\KHI_collector> _	r.ps1 -version Skype4B

- 3. Keep the load running for at least 60 minutes, and then stop the data gathering with the **logman stop KHI** command.
- 4. Collect all .csv files created by this process from the C:\PerfLogs\Admin folder on the Host, Front End and Edge and copy them to a single location on a computer where Microsoft Excel is installed.

5. Open the Key_Health_Indicators_-_Analysis_and_Definitions_Workbook_-_v1.1.xlsm, and then point it to the location where you stored the three server .csv files, by clicking the **Start** button.

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additional information on both the KHI process and actions to remediate. are refer to the KHI Guide VL door included in the tim Ne with this workhook.		

Figure 10-3: Key Health Indicators - CSV File Output

- 6. Under the **Pivots** tab, analyze the average values by using the KHI information from the KHI_Guide.docx. There are several KHI errors that are known to occur as a result of the load on CloudBond 365. These errors can be ignored, including:
 - For Enterprise server:
 - Disk read
 - SQL page life expectancy
 - Dbsore queue latency/sproc latency
 - Inoming responses dropped/sec
 - SIP local 503 responses/sec
 - SIP average outgoing queue delay
 - For Pro server:
 - Memory
 - Disk read
 - MSSQL page life expectancy
 - Peers (clients)\SIP average outgoing queue delay
 - Protocol\SIP average incoming message processing time
 - Load management\SIP average holding time for incoming messages
 - For Standard Plus:
 - Disk read
- **7.** On the Host, use the performance monitor application to verify that the following performance counter is within the desired threshold (within 70%):

HyperV Hypervisor Logical Processor -> % Total Run time

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