

H A R D W A R E & S O F T W A R E S P E C I F I C A T I O N

Rainbow CTI & Media Bridge



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1 Document History

Edition	Date	Changes / Comments / Details
01	16/02/2018	Initial specification guide.
02	01/03/2018	Virtual PC Specifications added.
03	18/04/2018	List of supported PBX platforms and terminals added.
04	05/01/2019	List of supported OS has been changed.
04	05/04/2019	List of supported OS has been changed.
05	10/07/2019	List of supported OS has been changed.
06	01/11/2019	List of supported PBX has been modified.
06	14/11/2019	List of supported handsets for different PBX has been modified.
07	09/12/2019	List of supported OS and their compatability with connector application has been modified.
08	31/01/2020	Supported version for NEC 3C PBX has been modified.
08	31/01/2020	List of supported handsets for CISCO, NEC 3C and Mitel PBX has been modified.
09	16/07/2020	List of supported PBX has been modified.
10	16/07/2020	List of supported handsets for different PBX has been modified.
11	07/01/2021	New recommendation has been added.
12	04/05/2021	<p>Section 4 List of supported handsets for Asterisk PBX has been modified</p> <p>Section 5 A new section has been added for Known limitations. Remaining sections have been renumbered.</p> <p>Section 8 A new section for IP Flow matrix has been added.</p> <p>Section 9 A new section for Firewall Configuration has been added.</p>
13	22/10/2021	<p>Section 4.6 New section has been added.</p> <p>Section 5.1 A General limitation has been removed.</p> <p>Section 5.2 A limitation related to CUCUM has been removed.</p> <p>Section 5.6 A new section has been added.</p> <p>Section 6 IP flow matrix has been updated with OpenScape 4000 connection information.</p> <p>Section 7 CSTA connection port information has been updated.</p>
14	09/12/2021	<p>Section 4.7 New section has been added.</p> <p>Section 5.1 A General limitation has been added.</p> <p>Section 5.7 New section has been added.</p> <p>Section 6 IP flow matrix has been updated with Panasonic connection information.</p>
15	14/01/2022	<p>Legal notice has been updated. Year of copyright has been updated in the footer of each page.</p> <p>Section 2 Versions & memory size requirements have been updated for .Net Framework & Microsoft Visual C++ Runtime. A note has been added.</p> <p>Section 3</p>

Edition	Date	Changes / Comments / Details
		Versions & memory size requirements have been updated for .Net Framework & Microsoft Visual C++ Runtime A note has been added.

2 Physical PC Requirements

Up to 200 Units (* Maximum 200 Monitored Extensions)

Description	Specification	Requirement
Processor	2.2 GHz i5 or equivalent	N/A
RAM	8 GB	N/A
Hard Disk Drive	NTFS	300 GB
Network Card(s)	1 Gigabit or more	N/A
Operating System	Windows 10 (64 bit) - English Windows Server 2012 (64 bit) - English Windows Server 2016 (64 bit) - English Windows Server 2019 (64 bit) - English	N/A
Pre-Requisites	MS .Net Framework 4.8*	800 MB
	Microsoft Visual C++ 2022 Runtime*	350 MB
	Internet Information Services (IIS) 7+	800 MB

*This pre-requisite is bundled with installation package, so you don't have to install it separately.

Up to 400 Units (* Maximum 400 Monitored Extensions)

Description	Specification	Requirement
Processor	2.6 GHz i7 or equivalent	N/A
RAM	8 GB	N/A
Hard Disk Drive	NTFS	150 GB
Network Card(s)	1 Gigabit or more	N/A
Operating System	Windows 10 (64 bit) - English Windows Server 2012 (64 bit) - English Windows Server 2016 (64 bit) - English Windows Server 2019 (64 bit) - English	N/A
Pre-Requisites	MS .Net Framework 4.8*	800 MB
	Microsoft Visual C++ 2022 Runtime*	350 MB
	Internet Information Services (IIS) 7+	800 MB

*This pre-requisite is bundled with installation package, so you don't have to install it separately.

600 Units or more (* 600 Monitored Extensions)

Description	Specification	Requirement
Processor	2.6 GHz i7 or equivalent	N/A
RAM	16 GB	N/A
Hard Disk Drive	NTFS	150 GB
Network Card(s)	1 Gigabit or more	N/A
Operating System	Windows 10 (64 bit) - English Windows Server 2012 (64 bit) - English Windows Server 2016 (64 bit) - English Windows Server 2019 (64 bit) - English	N/A
Pre-Requisites	MS .Net Framework 4.8*	800 MB
	Microsoft Visual C++ 2022 Runtime*	350 MB
	Internet Information Services (IIS) 7+	800 MB

*This pre-requisite is bundled with installation package, so you don't have to install it separately.

3 Virtual System Requirements

Up to 200 Units (* Maximum 200 Monitored Extensions)

Description	Specification	Requirement
vCPUs	2	N/A
RAM	8 GB	N/A
Hard Disk Drive	NTFS	150 GB
Network Card(s)	1 Gigabit or more	N/A
Operating System	Windows 10 (64 bit) - English Windows Server 2012 (64 bit) - English Windows Server 2016 (64 bit) - English Windows Server 2019 (64 bit) - English	N/A
Hosting platform	Windows Hyper-V 6.1.760 or ESXi 6.5	N/A
Pre-Requisites	MS .Net Framework 4.8*	800 MB
	Microsoft Visual C++ 2022 Runtime*	350 MB
	Internet Information Services (IIS) 7+	800 MB

*This pre-requisite is bundled with installation package, so you don't have to install it separately.

Up to 400 Units (* Maximum 400 Monitored Extensions)

Description	Specification	Requirement
vCPUs	4	N/A
RAM	8 GB	N/A
Hard Disk Drive	NTFS	150 GB
Network Card(s)	1 Gigabit or more	N/A
Operating System	Windows 10 (64 bit) - English Windows Server 2012 (64 bit) - English Windows Server 2016 (64 bit) - English Windows Server 2019 (64 bit) - English	N/A
Hosting platform	Windows Hyper-V 6.1.760 or ESXi 6.5	N/A
Pre-Requisites	MS .Net Framework 4.8*	800 MB

	Microsoft Visual C++ 2022 Runtime*	350 MB
	Internet Information Services (IIS) 7+	800 MB

*This pre-requisite is bundled with installation package, so you don't have to install it separately.

600 Units or more (* 600 Monitored Extensions)

Description	Specification	Requirement
vCPUs	4	N/A
RAM	16 GB	N/A
Hard Disk Drive	NTFS	150 GB
Network Card(s)	1 Gigabit or more	N/A
Operating System	Windows 10 (64 bit) - English Windows Server 2012 (64 bit) - English Windows Server 2016 (64 bit) - English Windows Server 2019 (64 bit) - English	N/A
Hosting platform	Windows Hyper-V 6.1.760 or ESXi 6.5	N/A
Pre-Requisites	MS .Net Framework 4.8*	800 MB
	Microsoft Visual C++ 2022 Runtime*	350 MB
	Internet Information Services (IIS) 7+	800 MB

*This pre-requisite is bundled with installation package, so you don't have to install it separately.

4 PBX Platforms and Terminals

4.1 CISCO Unified Communication Manager

Versions Supported	v9.x, 10.x, 11.x, 12.x
Communication mode	CTI Events - TAPI Phonebook & Users - Administrative XML Web Service (AXL)
Supported Phone sets and Terminals	<ul style="list-style-type: none"> • Cisco 79xx Series Phones • Cisco Unified IP Phone 6921 • Cisco Unified IP Phone 9951 (Camera Phones) • Cisco DX650 Video Phone

4.2 Mitel MiVoice

Versions supported	MiVoice 250
Communication mode	CTI Events - OAI & CT Gateway Phonebook & Users - OAI & CT Gateway
Supported Phone sets and Terminals	<ul style="list-style-type: none"> • IP Phones: 5304, 5312, 5320, 5320e, 5330e, 5340e, 5360 • Digital Phones: 8528, 8568

4.3 NEC iS3000

Versions supported	NEC iS3000
Communication mode	CTI Events - CSTA Phase I
Supported Phone sets and Terminals	<ul style="list-style-type: none"> • IP Phones • Digital Phones

4.4 NEC iS4000

Versions supported	NEC iS4000
Communication mode	CTI Events - CSTA Phase I
Supported Phone sets and Terminals	<ul style="list-style-type: none"> • IP Phones • Digital Phones

4.5 Asterisk

Versions supported	v11.21.1, v11.21.2, v11.21.3, v16.x, v17.x
Communication mode	CTI Events - Asterisk Manager Interface (AMI)
Supported Phone sets and Terminals	<ul style="list-style-type: none"> • SIP enabled handsets • SIP enabled soft phones

4.6 OpenScape 4000

Versions supported	v8 R2.22.5
Communication mode	CTI Events - CSTA
Supported Phone sets and Terminals	<ul style="list-style-type: none"> • IP Phones • Digital Phones

4.7 Panasonic

Versions supported	v005.30037 - NSX2000
Communication mode	CTI Events - CSTA

Supported Phone sets and Terminals	<ul style="list-style-type: none">• IP Phones• Digital Phones
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NOTE: TAPI, CSTA and other PBX specific licenses may be needed for CTI monitoring and telephony events. Please check with your telephone system vendor for licenses status and their activation.

TSP software is required for CISCO Unified Communication Manager so please check with your business partner for its availability and installation.

5 Known Limitations

5.1 General

This section contains all the known limitations applicable on Rainbow CTI & Media Bridge agnostic of the telephone system.

- Pure VOIP mode i.e., “control of extensions that are not registered to a telephone system” is only supported for Asterisk telephone systems.
- Auto syncing of extensions between the telephone system and the Rainbow Server is not supported. Therefore, the Rainbow CTI & Media Bridge services need to be restarted after configuring new extension(s) in the telephone system.
- For CTI, CTI & VOIP, and pure VOIP mode, incoming call forwarding and transfer to a voicemail number is not supported.
- A rainbow user when in a webRTC (CTI & VOIP, or VOIP mode) call conversation, cannot receive another incoming call.
- For attended and unattended call transfer scenarios, CLI display for the last party i.e., telephone system extensions, PSTN caller; is not updated after call transfer, however, CLI display is updated for the Rainbow users.
- A Rainbow user in CTI & VOIP, or VOIP mode cannot initiate an attended/unattended transfer/conference between a PBX call and a Rainbow call.
- Nomadic mode (other phone option) is not supported for third party telephone systems.
- A Rainbow user in CTI & VOIP, or VOIP mode cannot perform a multi-hop transfer.

5.2 CISCO Unified Communications Manager (CUCM)

This section contains all the limitations applicable on Rainbow CTI & Media Bridge when used specifically for CISCO Unified Communications Manager.

- Shared extensions are not supported.

5.3 Asterisk

This section contains all the limitations applicable on Rainbow CTI & Media Bridge when used specifically for Asterisk.

- Rainbow CTI & Media Bridge application do not provide support to control extensions when a Rainbow user is in CTI mode.

5.4 NEC iS3000

This section contains all the limitations applicable on Rainbow CTI & Media Bridge when used specifically for NEC iS3000.

- Rainbow CTI & Media Bridge application do not provide support to automatically fetch extensions from the telephone system, and therefore, the extensions need to be added manually through the administration interface.

5.5 NEC iS4000

This section contains all the limitations applicable on Rainbow CTI & Media Bridge when used specifically for NEC iS4000

- Rainbow CTI & Media Bridge application do not provide support to automatically fetch extensions from the telephone system, and therefore, the extensions need to be added manually through the administration interface.

5.6 OpenScape 4000

This section contains all the limitations applicable on Rainbow CTI & Media Bridge when used specifically for OpenScape 4000.

- Rainbow CTI & Media Bridge application do not provide support to automatically fetch extensions from the telephone system, and therefore, the extensions need to be added manually through the administration interface.
- Monitoring of Analog extensions is not supported and cannot be used by Rainbow users for CTI and VOIP calling.

5.7 Panasonic

This section contains all the limitations applicable on Rainbow CTI & Media Bridge when used specifically for Panasonic.

- Rainbow CTI & Media Bridge application do not provide support to automatically fetch extensions from the telephone system, and therefore, the extensions need to be added manually through the administration interface.
- Monitoring of Analog extensions is not supported and cannot be used by Rainbow users for CTI and VOIP calling.

6 IP Flow Matrix

Object	Protocol	From	Source Port	To	Destination Port	Traffic Flow
Mitel MiVoice 250 OAI & CT Gateway Connection	TCP	CTI & Media Bridge	Dynamic	MiVoice 250	4000	LAN
Asterisk AMI Connection	TCP	CTI & Media Bridge	Dynamic	Asterisk	5038	LAN
NEC iS3000 Connection	TCP (CSTA)	CTI & Media Bridge	Dynamic	NEC iS3000	2555	LAN
NEC iS4000 Connection	TCP (CSTA)	CTI & Media Bridge	Dynamic	NEC iS4000	2555	LAN
OpenScape 4000 Connection	TCP (CSTA)	CTI & Media Bridge	Dynamic	OpenScape 4000	1040	LAN
Panasonic Connection	TCP (CSTA)	CTI & Media Bridge	Dynamic	Panasonic	33333	LAN
Rainbow Server (PCG) Connection	Multiplex Secure web-sockets (TLS)	CTI & Media Bridge	Dynamic	Rainbow Server (PCG & XMPP)	443	WAN
Web Administration	TCP/IP	CLI PC	Dynamic	CTI & Media Bridge	80	LAN
REST API	TCP/IP	CLI PC	Dynamic	CTI & Media Bridge	80	Loopback

Object	Protocol	From	Source Port	To	Destination Port	Traffic Flow
CTI & Media Bridge connectivity with CTI server	TCP	CTI & Media Bridge	Dynamic	CTI Server	8001	Loopback
CTI & Media Bridge connectivity with Media server	Secure web-sockets	CTI & Media Bridge	Dynamic	Media Server	9004	Loopback
CTI & Media Bridge Email sending	SMTP	CTI & Media Bridge	Dynamic	SMTP Server	25	LAN
CTI & Media Bridge connectivity with webRTC Gateway	SSH	CTI & Media Bridge	Dynamic	webRTC Gateway	22	LAN
CTI & Media Bridge connectivity with PBX over SIP Trunk	SIP/UDP	CTI & Media Bridge	Dynamic	PBX	5060	LAN

7 Firewall Matrix

In addition to the pre-requisites, you also need to ensure that any active firewalls have been configured correctly to allow traffic from Rainbow CTI & Media Bridge. If firewall has not been properly configured, Rainbow CTI & Media Bridge might not operate properly.

Reference	Port Type	Port Number
CSTA Connection Port	TCP	1040, 2555, 33333
OAI & CT Gateway Connection Port	TCP	4000
AMI Connection Port	TCP	5038
IIS Port	TCP/UDP	80
SMTP Port	TCP	25
SSH Port	SSH	22
CTI & Media Bridge connectivity with CTI server	TCP	8001
CTI & Media Bridge connectivity with Media server	Secure web-sockets	9004
CTI & Media Bridge connectivity with Rainbow Server	Multiplex Secure web-sockets (TLS)	443
Media Server connectivity with webRTC Gateway	SIP/UDP	5060
Media Server connectivity with PBX	SIP/UDP	5060
Media Server processing for MOH & Silence Audio Packets	UDP	2001,1000,1001,9000,3000
Conference Manager Ports for Media/RTP Processing	UDP	8010 - 8041

Conference Manager Port for SIP	SIP/UDP	7000
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8 Remote Support Requirements

IMPORTANT! In order to gain access to support, the Rainbow Connectors software, customer must have a valid support contract.

To provide support for remote software installations and product maintenance, it is necessary for the customer to provide remote access to the PC / VM where the software is installed. The table below displays the remote access tools that contain the features and functionality required for performing the necessary remote support tasks.

Remote Access - Recommended Software (In order of preference)

Software	Website	Version
Team Viewer (Commercial Version)	www.teamviewer.com	V8.0 or above
GoTo Meeting (Business Version)	www.gotomeeting.com	N/A
Other	Access to be provided by the customer	N/A

If you wish to use additional tools to provide remote access you must ensure that they provide our support & maintenance engineers with the appropriate functionality, these have been listed below.

Required Features & Functionalities

Description:

1. Full remote control over the PC / VM
2. Ability to transfer files to and from the PC / VM
3. Allow a continuous session without disconnections
4. Self-restart after the PC / VM has been rebooted.

9 Constraints & Recommendations

IMPORTANT!

1. Do not exceed the specified number of monitored extensions for any of the machine models specified in this Hardware/Software Specification.
2. No third-party software, unless stated in this Hardware/Software Specification, must be installed on the Rainbow CTI & Media Bridge PC, as this will invalidate the support warranty.
3. Rainbow CTI & Media Bridge works with cloud services and part of its functions involve uploading of PBX data to the cloud server through secure mediums.
4. Windows Update service must be enabled.

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