

---

# **Yealink VCS Network Deployment Solution**

**Aug. 2017**

**V23.20**



# Table of Contents

<b>Table of Contents</b> .....	<b>iii</b>
<b>Network Requirements Overview</b> .....	<b>1</b>
Bandwidth Requirements .....	1
Bandwidth Requirement for the Head Office .....	1
Bandwidth Requirement for the Branch Office .....	2
Bandwidth Testing .....	2
Static Public IP Address Requirement for the Head Office .....	3
<b>VCS Deployment Method</b> .....	<b>5</b>
Traditional Deployment Methods .....	5
Scenario 1: Private IP Deployment.....	5
Scenario 2: Public IP Deployment (leased lines).....	6
Scenario 3: Intelligent Traversal Deployment.....	6
Cloud Deployment Method .....	7
Yealink VC Cloud Management Deployment Method .....	7
Yealink Meeting Server Deployment Method .....	8
Third-Party Platform Deployment Method .....	9
<b>VCS Network Deployment</b> .....	<b>13</b>
VCS Network Settings .....	13
Firewall/Router Settings .....	14
QoS Guarantees.....	14
<b>Connectivity Testing and Troubleshooting</b> .....	<b>15</b>
Connectivity Testing .....	15
VCS Network Connectivity Testing .....	15
Remote Office Fails to Connect Local Office .....	16
Abnormal Conditions during a Call .....	17



# Network Requirements Overview

## Bandwidth Requirements

Because the video conferencing system (VCS) is a real-time network application, it has high bandwidth requirements. Recommended bandwidths are shown below.

### Bandwidth requirements of the Yealink video conferencing system:

Video Resolution	Recommended Bandwidth
Full HD 1080P (1920x1080)	1.3Mb
Full HD + content: (people+ content)	2.6Mb
HD 720P (1280x720)	665Kb
HD + content: (people + content)	1.4Mb
SD 448P (768x448)	333Kb
SD + content (people + content)	666Kb

### Other network requirements of the Yealink video conferencing system:

Delay	General VCS delay is less than 200ms
Jitter	Jitter is less than 50ms
Packet lost	Packet loss is less than 1%

## Bandwidth Requirement for the Head Office

### The calculation formula is as follows:

Bandwidth requirement for the head office = N x bandwidth requirement for one single branch office

### Take 3 branch offices as an example:

To achieve the full HD effect, bandwidth requirement for the head office = 1.3Mbps x 3 = 3.9 Mbps.

Presentations are often needed during a video conference. This means that every office needs double bandwidth for presentation.

If a presentation is needed, bandwidth requirement for the head office = 1.3Mbps x 2 x 3 = 7.8Mbps.

## Bandwidth Requirement for the Branch Office

Bandwidth requirement for the branch office = bandwidth requirement for a single branch office.

**For example:**

To achieve the full HD effect, the total bandwidth requirement is 1.3Mbps. If presentation is needed, 2.6 Mb is needed.

**Note**

An independent fiber optic line is recommended for the video conferencing system instead of sharing bandwidth with other office systems. If network sharing cannot be avoided, you are advised to take QoS measures to control the network traffic.

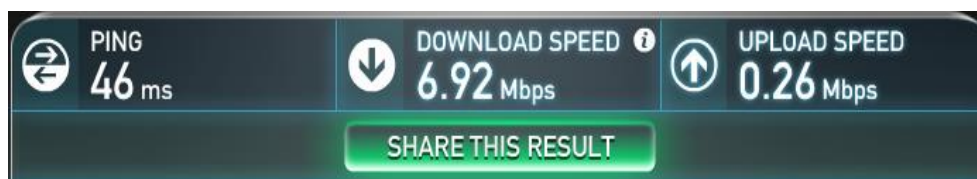
## Bandwidth Testing

Once you know VCS bandwidth requirements, carry out the following steps to test whether your current bandwidth meets demand.

1. Enter <http://www.speedtest.net/> in the address bar of a web browser on your PC, and then press the **Enter** key.
2. Click **Begin Test** button.



3. Test result:



- **PING:** the ideal PING value is less than 100ms, so the test above shows that the network delay is low.
- **DOWNLOAD:** Downlink bandwidth.
- **UPLOAD:** Uplink bandwidth.
- Recommended bandwidth is 1080P and recommended uplink/downlink bandwidth is 1.3Mb.

The ideal uplink and downlink bandwidths are 1.5Mb. Downlink and uplink bandwidths may be asymmetric, so focus on the uplink bandwidth.

According to the result above, if the current network cannot meet the needs, please upgrade your network. Otherwise, your video conference system will not achieve the desired effects.

## **Static Public IP Address Requirement for the Head Office**

The head office is advised to have a static public IP address.





## VCS Deployment Method

VCS supports two network deployment methods: traditional deployment and Cloud deployment. Choose the desired deployment method according to your needs.

### Traditional Deployment Methods

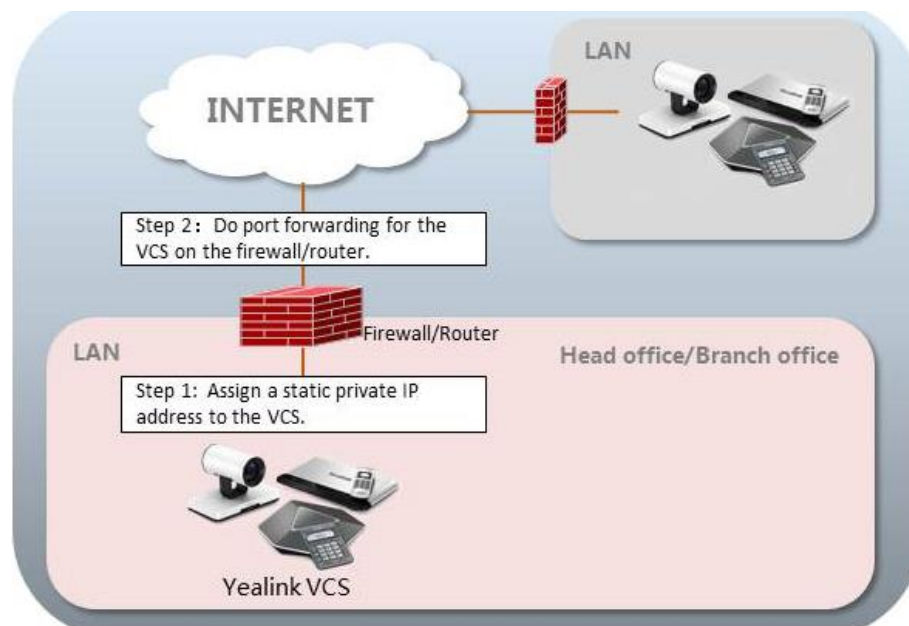
If you do not log into the Cloud platform, you can choose traditional deployment method to deploy your VCS, and dial IP addresses of other devices to make a call.

There are three common deployment scenarios. For the head office, you can deploy the VCS using the first two methods. For the branch office, you can follow the same deployment steps as for the head office, or use the intelligent traversal to deploy the VCS.

Scenario	Description	Other
Private IP Deployment	To deploy the VCS over an intranet (behind a firewall), you must assign a static private IP address to the VCS. In the meantime, carry out port forwarding on the firewall.	This is often used in the head office. Both inbound and outbound calls are available.
Public IP Deployment	To deploy the VCS over a public network, you need to assign a public IP address to the VCS.	This is often used in the head office. Both inbound and outbound calls are available.
Intelligent Traversal Deployment	Assign a private IP address which can access the public network to the VCS. It is a plug-and-play solution, which means that you can deploy the VCS without any firewall configuration.	This is often used in branch offices. Only outbound calls are available.

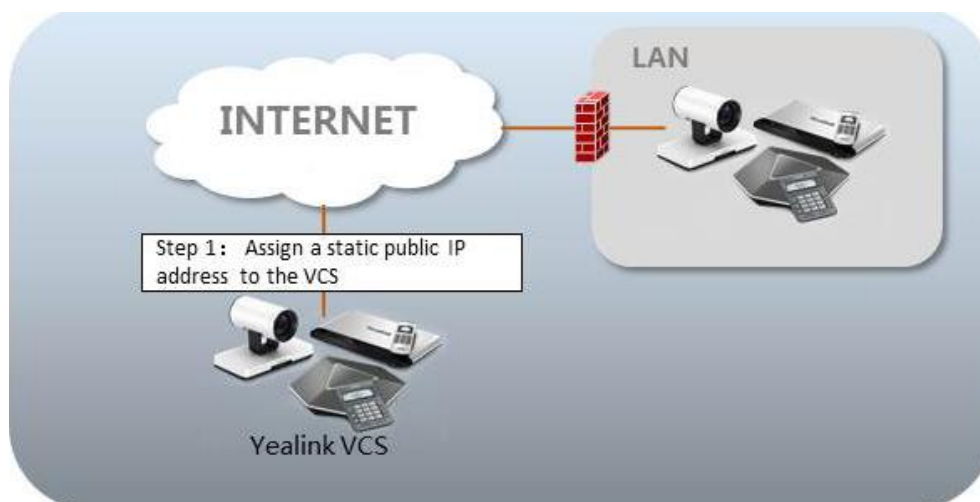
### Scenario 1: Private IP Deployment

The most common deployment scenario is deploying the VCS over an intranet (behind a firewall). The private IP address should be forwarded to the public network by port forwarding. This deployment method involves a simple setup process and high security. In addition, it is a low cost solution. Both the head office and branch offices can deploy the VCS in this way.



## Scenario 2: Public IP Deployment (leased lines)

Some enterprises have high video conference performance requirements. To avoid bandwidth congestion, you can configure a leased line to connect the VCS to the public network directly. This deployment method involves a simple setup process and creates a stable network environment. However, it is more expensive due to leased line costs. This method is often used in the head office.

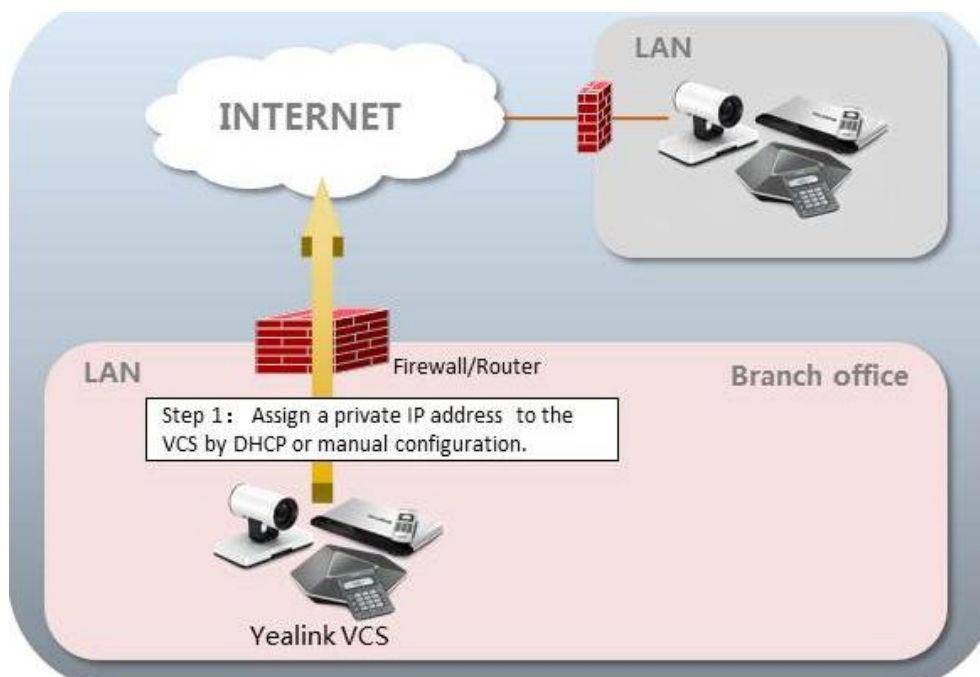


## Scenario 3: Intelligent Traversal Deployment

Some branch offices lack IT professionals, which means that professional network configuration (e.g., port forwarding) is impossible.

Yealink VCS supports intelligent traversal deployment. You can deploy the VCS over an intranet, and assign a private IP address which can access the public network to the VCS.

This deployment method involves a simple setup process. It is a plug-and-play solution which means that you can deploy the VCS without any firewall configuration. Using this method, inbound calls are unavailable, only outbound calls are available.



## Cloud Deployment Method

When holding a video conference, customers often encounter several problems, such as no public IP address, weak network infrastructure, complicated firewall configuration, inefficient deployment and no traversal server.

Cloud-based technology drives positive change in the way organizations communicate. With video conferencing service, organizations can communicate easily using the Cloud platform. Public IP address and complex network settings are unnecessary.

Challenges such as infrastructure costs and interoperability are eliminated. Both the head office and the branch offices can use the Cloud deployment method. Both inbound and outbound calls are available.

You can log into the Yealink VC Cloud Management Service/Yealink Meeting Server/StarLeaf/BlueJeans/Pexip/Mind/Custom platform using Yealink video conferencing system.

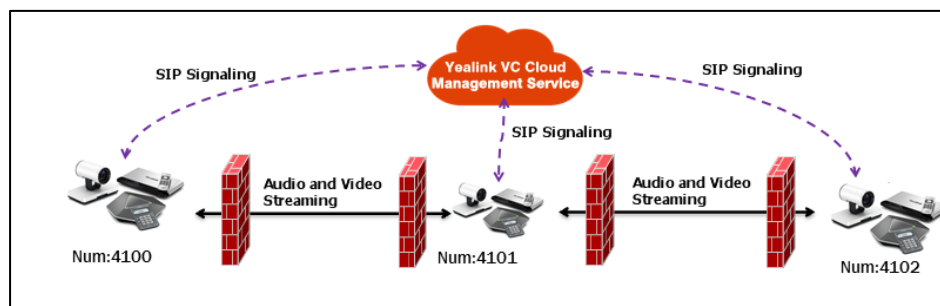
The following describes the Cloud deployment method:

- [Yealink VC Cloud Management Deployment Method](#)
- [Yealink Meeting Server Deployment Method](#)
- [Third-Party Platform Deployment Method](#)

## Yealink VC Cloud Management Deployment Method

The Yealink VC Cloud Management Service platform is a Cloud-based service platform for Yealink video conferencing systems. You do not need public IP addresses and configuration on the firewall/router.

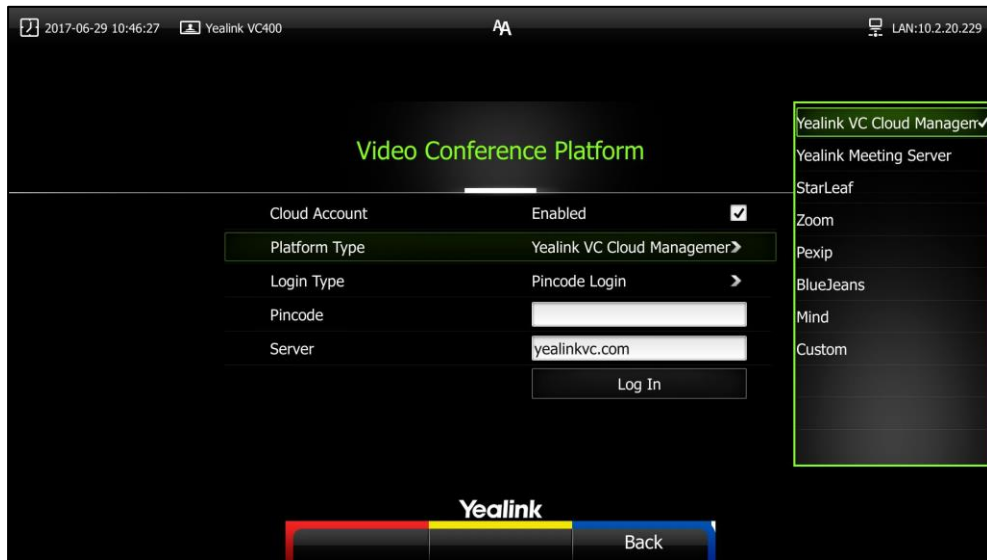
Take image below as an example: three video conferencing systems are deployed in different networks, and they all register Yealink Cloud accounts. Yealink VC Cloud management service deployed in public network can help traverse SIP signaling and media streaming, so that the video conferencing systems can communicate with each other without public IP addresses and complex network settings.





**To log into the Yealink VC Cloud Management Service via the remote control:**

1. Select **Menu->Advanced** (default password: 0000)->**Video Conference Platform**.
2. In the **Cloud Account** filed, check the **Enabled** checkbox.

3. Select **Yealink VC Cloud Management Service** from the pull-down list of **Platform Type**.



4. Enter the IP address or domain name of the Yealink VC Cloud Management Service platform in the **Server** field.
5. Select desired sign-in method from the pull-down list of **Login Type**:
  - If you select **Build-in Cloud Number**:  
Press ▲ or ▼ to scroll to **Onekey Login**, and then press **OK**.
  - If you select **Pincode Login**:  
Enter your PIN code in the **Pincode** field, press ▲ or ▼ to scroll to **Log In**, and then press **OK**.
  - If you select **Username/Password**:  
Enter your Cloud number and password in the corresponding fields, you can also check the **Remember me** checkbox to remember your username and password.  
Press ▲ or ▼ to scroll to **Log In**, and then press **OK**.

After successful registration, the display device displays , and the LCD screen of the video conferencing phone displays .

## Yealink Meeting Server Deployment Method

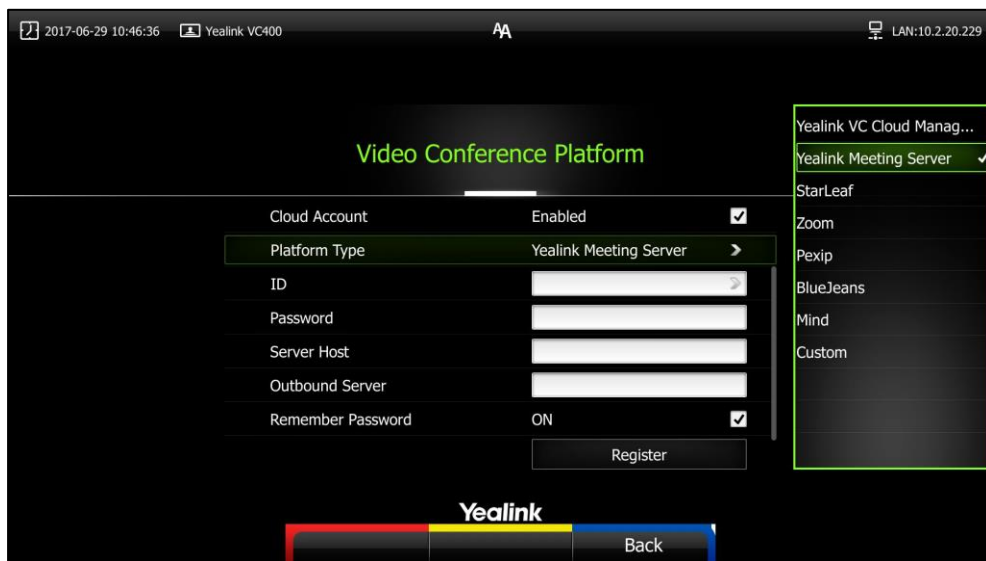
Yealink Meeting Server is an on-premise video conferencing solution. Services and infrastructure are maintained on a private network. Yealink Meeting Server offers great security and control.

After logging into the Yealink Meeting Server, the video conferencing system can receive conference reminder from the Yealink Meeting Server or Microsoft Outlook software, and then join the scheduled conferences. For more information on how to join the scheduled conferences, refer to the [Video Conferencing System User Guide](#).

### To log into the Yealink Meeting Server via the remote control:

1. Select **Menu->Advanced** (default password: 0000) -> **Video Conference Platform**.
2. In the **Cloud Account** filed, check the **Enabled** checkbox.

3. Select **Yealink Meeting Server** from the pull-down list of **Platform Type**.



4. Configure the Yealink Meeting Server.
5. Check the **Remember Password** checkbox to remember your registration information.
6. Press ▲ or ▼ to scroll to Register, and then press **OK**.  
After successful registration, the display device displays ☁, and the LCD screen of the video conferencing phone displays ☁.

## Third-Party Platform Deployment Method

Yealink provides broad compatibility and seamless interoperability with the industry's leading Cloud-based video conferencing platforms and on-premise solutions.

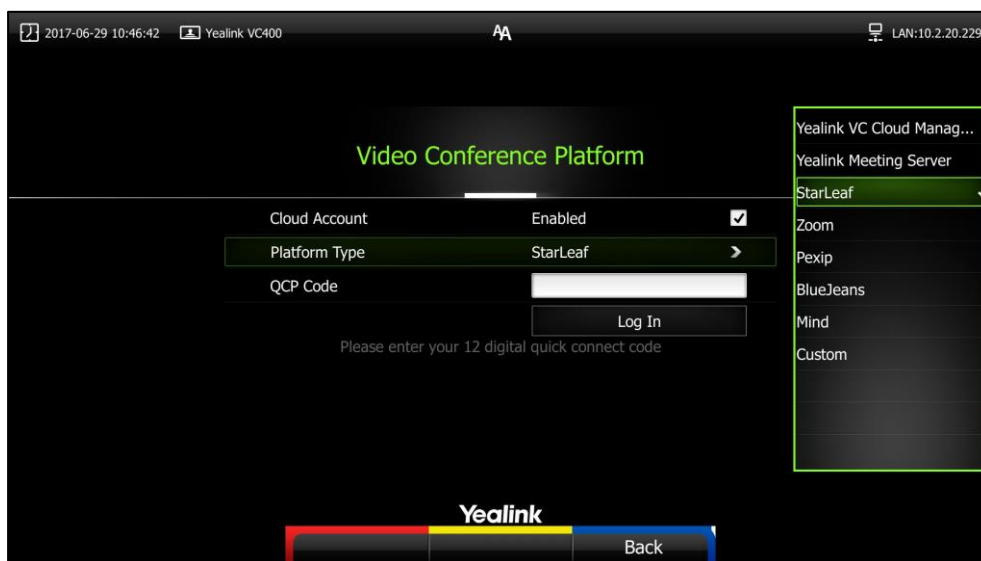
Yealink video conferencing systems are compatible with StarLeaf/Zoom/BlueJeans/Pexip/Mind/Custom platform. Customers can benefit from both the features provided by video conferencing system, such as 1080p HD video and audio, and features provided by the third-party platform, including high end customization & interoperability.




Once logging into the third-party platform, video conferencing systems can communicate with each other by entering Virtual Meeting Rooms (VMRs).

### To log into the StarLeaf Cloud platform via the remote control:

1. Select **Menu->Advanced** (default password: 0000)-> **Video Conference Platform**.
2. In the **Cloud Account** filed, check the **Enabled** checkbox.

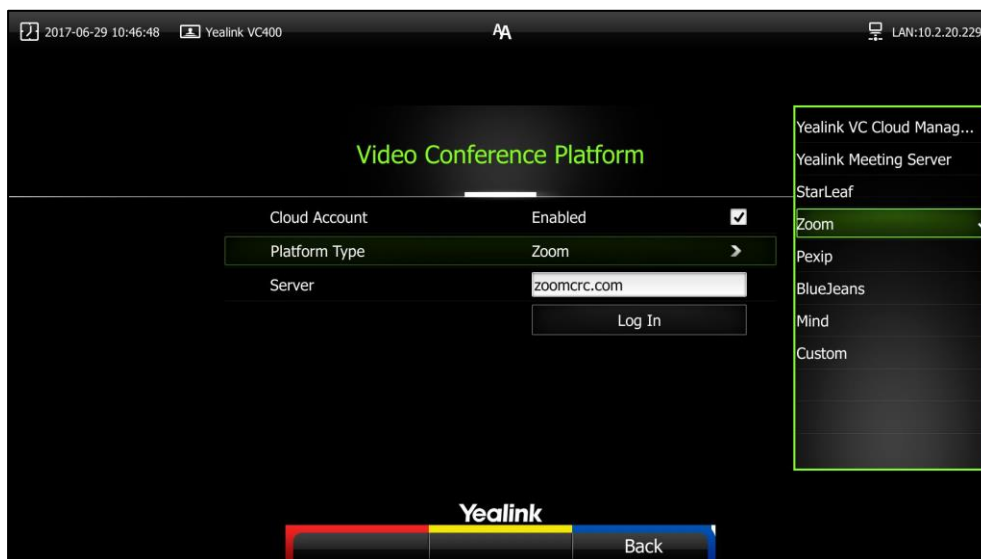
3. Select **StarLeaf** from the pull-down list of **Platform Type**.






4. Enter the quick access code in the **QCP Code** field.  
Press ▲ or ▼ to scroll to **Log In**, and then press .  
After successful registration, the display device displays , and the LCD screen of the video conferencing phone displays .

**To log into the Zoom Cloud platform via the remote control:**

1. Select **Menu->Advanced** (default password: 0000)->**Video Conference Platform**.
2. In the **Cloud Account** field, check the **Enabled** checkbox.
3. Select **Zoom** from the pull-down list of **Platform Type**.

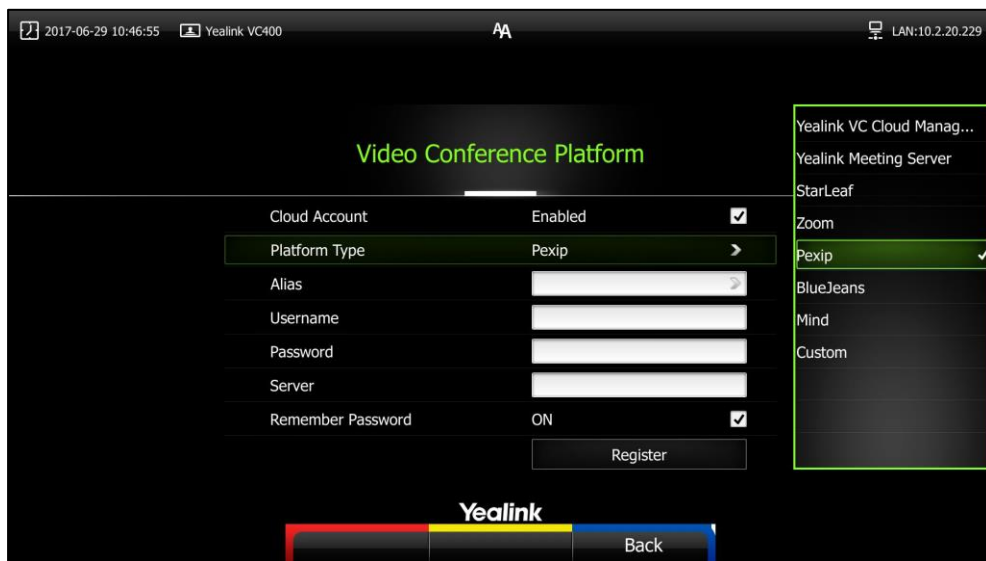


4. Enter the domain names or IP addresses of Zoom server in the **Server** field.  
The default Zoom server address is "zoomcrc.com".
5. Press ▲ or ▼ to scroll to **Log In**, and then press .  
After successful registration, the display device displays , and the LCD screen of the video conferencing phone displays .

**To log into the Pexip platform via the remote control:**

1. Select **Menu->Advanced** (default password: 0000)->**Video Conference Platform**.
2. In the **Cloud Account** field, check the **Enabled** checkbox.

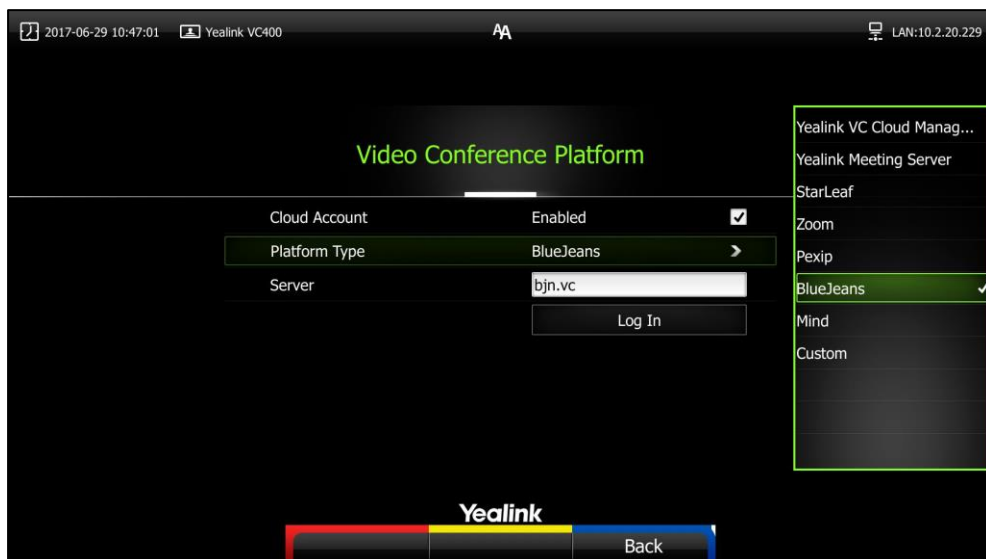
3. Select **Pexip** from the pull-down list of **Platform Type**.



4. Configure the Pexip platform.
5. Check the **Remember Password** checkbox to remember your registration information.
6. Press ▲ or ▼ to scroll to **Register**, and then press **OK**.  
After successful registration, the display device displays ☁, and the LCD screen of the video conferencing phone displays ☁.

**To log into the BlueJeans Cloud platform via the remote control:**

1. Select **Menu->Advanced** (default password: 0000) -> **Video Conference Platform**.
2. In the **Cloud Account** field, check the **Enabled** checkbox.
3. Select **BlueJeans** from the pull-down list of **Platform Type**.

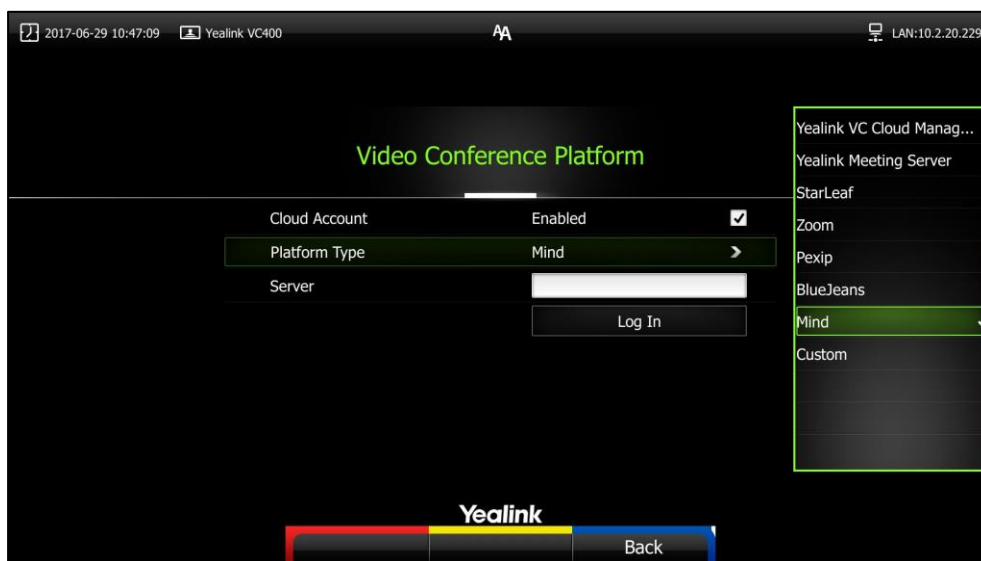




4. Enter the domain names or IP addresses of BlueJeans server in the **Server** field.  
The default BlueJeans server address is "bjn.vc".
5. Press ▲ or ▼ to scroll to **Log In**, and then press **OK**.  
After successful registration, the display device displays ☁, and the LCD screen of the video conferencing phone displays ☁.

**To log into the Mind platform via the remote control:**

1. Select **Menu->Advanced** (default password: 0000)-> **Video Conference Platform**.
2. In the **Cloud Account** field, check the **Enabled** checkbox.

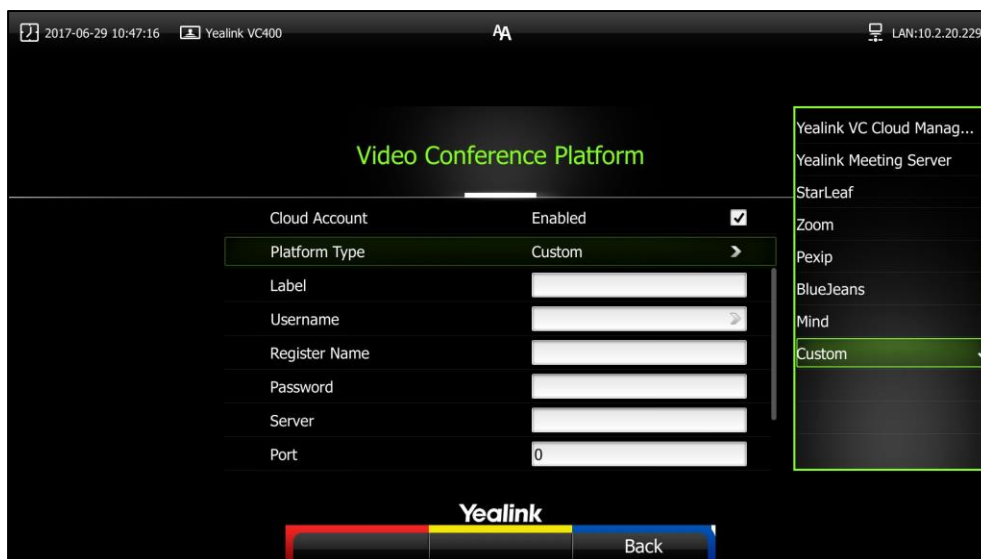
3. Select **Mind** from the pull-down list of **Platform Type**.



4. Enter the domain names or IP addresses of Mind server in the **Server** field.
5. Press ▲ or ▼ to scroll to **Log In**, and then press **OK**.  
After successful registration, the display device displays , and the LCD screen of the video conferencing phone displays .

**To log into the Custom platform via the remote control:**

1. Select **Menu->Advanced** (default password: 0000)->**Video Conference Platform**.
2. In the **Cloud Account** filed, check the **Enabled** checkbox.
3. Select **Custom** from the pull-down list of **Platform Type**.



4. Configure the custom platform.
5. Press ▲ or ▼ to scroll to **Log In**, and then press **OK**.



# VCS Network Deployment

## VCS Network Settings

Your video conferencing system can work normally only when the network settings are correct. The system attempts to contact a DHCP server in your network to obtain an IP address by default. It is recommended that you configure a static IPv4 address for the VCS.

### To configure a static IPv4 address via web user interface:

1. Enter the IP address of the system in the address bar of a web browser on your PC, and then press the **Enter** key.
2. Enter the administrator user name and password.  
The default user name is "admin" (case-sensitive), and the default password is "0000".
3. Click on **Network**->**LAN Configuration**.
4. In the **IPv4 Config** block, mark the **Static IP** radio box.
5. Enter the desired values in the **IP Address**, **Subnet Mask**, **Gateway**, **Primary DNS** and **Secondary DNS** fields.

The screenshot shows the Yealink VCS400 web interface. The 'Network' menu is active, and the 'LAN Configuration' section is expanded. Under 'IPv4 Config', the 'Static IP' radio button is selected. The following fields are visible and filled:

Field	Value
IP Address	192.168.1.10
Subnet Mask	255.255.255.0
Gateway	192.168.1.254
Static DNS	<input checked="" type="radio"/> On <input type="radio"/> Off
Primary DNS	192.168.1.166
Secondary DNS	192.168.1.167
Host Name	VC110

6. Click **Confirm** to save the change.  
The web user interface prompts "Warning: Settings will take effects after reboot. Reboot now?".
7. Click **Confirm** to reboot the system.

### To configure a static IPv4 address via phone user interface:

1. Select **Menu**->**Advanced** (default password: 0000)->**Internet Configuration**.
2. Select **IPv4** from the pull-down list of **IP Mode**.
3. Press **▲** or **▼** to scroll to **IPv4**, and then press **OK**.
4. Uncheck the **DHCP** checkbox.
5. Enter the desired values in the **IP Address**, **Subnet Mask**, **Gateway**, **DNS Primary Server** and **DNS Secondary Server** fields respectively.
6. Press the **Save** soft key to accept the change.  
The display device prompts "Reboot now?".

- Select **OK** to reboot the endpoint immediately.

**Note** Wrong network settings may result in inaccessibility of your system and may also have an impact on your network performance. For more information on these parameters, contact your system administrator.

## Firewall/Router Settings

The following table lists the commonly used ports of the VCS. If the following ports are restricted in your network environment, you need to open these ports.

If the VCS is deployed over an intranet and you are not using Cloud account, you should solve the interconnection problem between private and public network by port forwarding. You must forward the following ports to the public network on the firewall/router.

NO.	Function	Port	Type
1	H.323 signal port	1720	TCP
2	Audio & video media stream port	50000-50499	TCP/UDP
3	Web management port (optional)	443	TCP
4	SIP (optional)	5060-5061	TCP/UDP

**Note** It is recommended that you forward the web management port (443/TCP) of the branch office to the public network, so that the head office can manage the branch office remotely.

When the VCS is deployed over an intranet, you can also use the Cloud deployment method to solve the interconnection problem. Port forwarding is unnecessary. For more information, refer to [Cloud Deployment Method](#) on page 7.

## QoS Guarantees

To ensure VCS network stability, it is recommended that users enable the Quality of Service (QoS) feature for the VCS.



For more information on VCS bandwidth requirements, refer to [Bandwidth Requirements](#) on page 1.

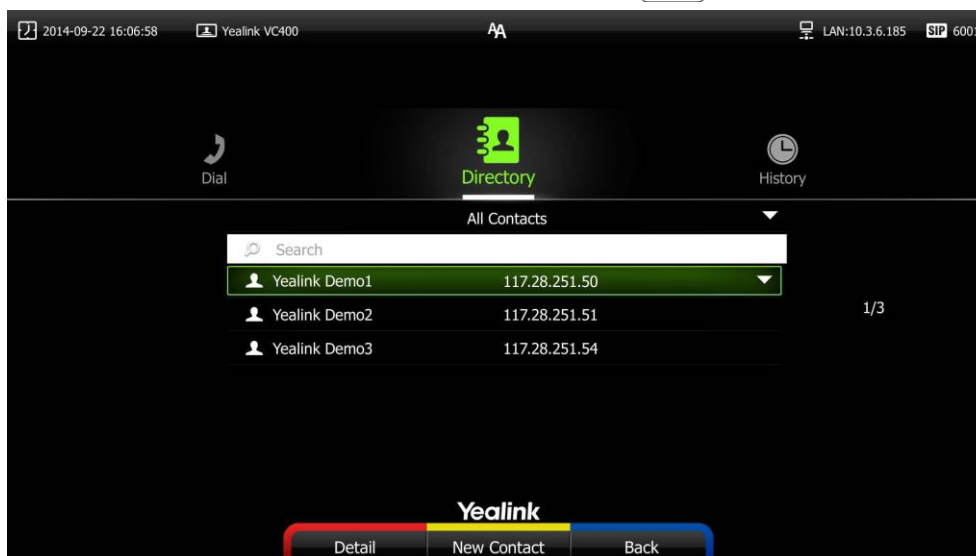
# Connectivity Testing and Troubleshooting

## Connectivity Testing

Yealink demo contacts can help users to test whether the system is working normally after the system has been installed.

### To place a test call via the remote control:

1. Press  (**Call** soft key).
2. Press ◀ or ▶ to select the **Directory** menu.
3. Press ▲ or ▼ to select Yealink Demo1 and then press .



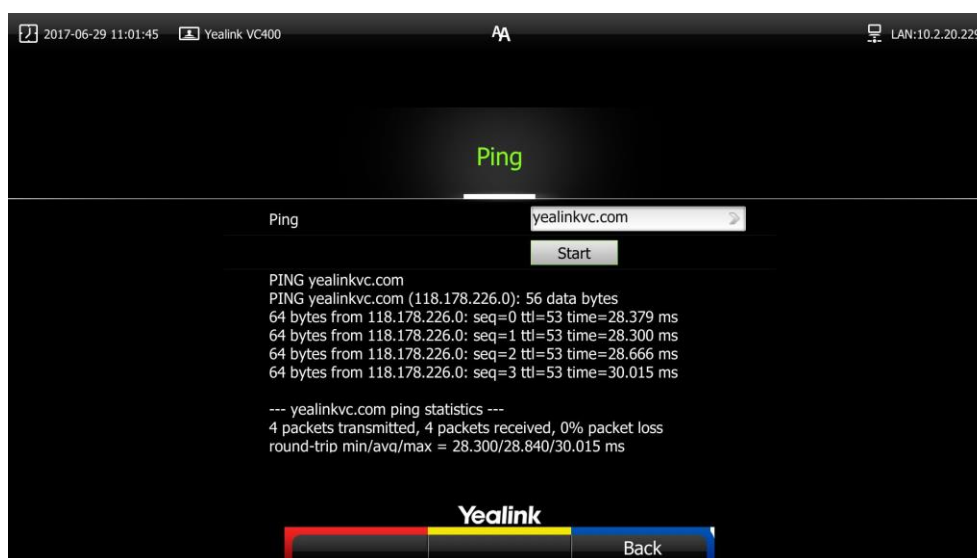
If the video call is established successfully, the network connectivity is normal. If the call fails, you can contact the system administrator to check the network connectivity and the access rights to the public network.

## VCS Network Connectivity Testing

### Network diagnosis:

1. Select **Menu->Diagnose ->Ping**.

2. Press ▲ or ▼ to select **Start**, and then press **OK**.



It measures the round-trip time from transmission to reception and reports errors and packet loss. The results of the test include a statistical summary of the response packets received, including the minimum, maximum, and the mean round-trip times.

3. You can also enter any IP address (for example, the IP address of the remote system) in the **Ping** field.
4. Press ▲ or ▼ to select **Stop**, and then press **OK**.
5. Press **Back** (Back soft key) to return to Diagnose menu.

## Remote Office Fails to Connect Local Office

Assume that you do not log into the Cloud platform, and choose to deploy your VCS over an intranet (behind a firewall).

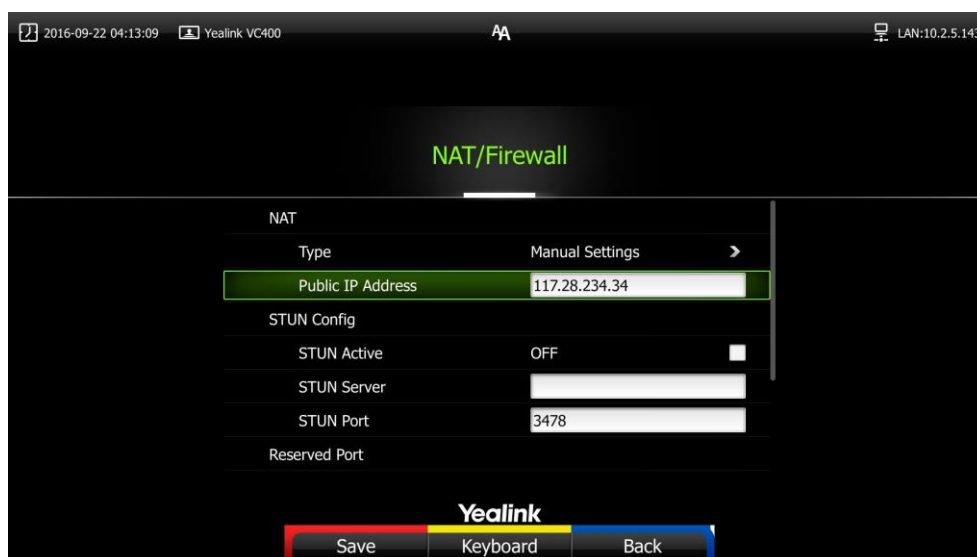
You have configured port forwarding on the firewall or gateway for VCS, but you find that local system appears black screen and you cannot hear sound when you call Yealink Demo Room or other systems, please check whether the port forwarding configuration is correct. For more information, refer to [Firewall/Router Settings](#) on page 14.

If port forwarding configuration is correct, the most likely reason is that the firewall or gateway in the environment does not support the H.323 ALG feature. In this situation, please take the following actions to activate the NAT feature on the VCS.


### To activate the NAT feature via the remote control:

1. Select **Menu**->**Advanced** (default password: 0000)-> **NAT/Firewall**.
2. Select **Auto** from the pull-down list of **Type**, the system will obtain a public IP address automatically.

- If the system does not obtain a public IP address automatically, select **Manual Settings** from the pull-down list of **Type**, and then enter the public IP address in the **Public IP address** field.



## Abnormal Conditions during a Call

If extensive pixel mosaic appears on the screen during the video conference, this may be caused by network instability. You can press  (**More** soft key) -> **Call Statistics** during the call to check current network conditions. Focus on the total packetloss and packet loss(%).

Type	Total Bandwidth	Recv(1924 kb/s)	Send(2119 kb/s)		Codec	G.722.1C	G.722.1C
Video	Resolution	1920 X 1080	1920 X 1080	Audio	Bandwidth	48 kb/s	48 kb/s
	Codec	H.264 High Profile	H.264 High Profile		Sample Rate	32 k	32 k
	Bandwidth	1876 kb/s	2071 kb/s		Jitter	5 ms	4 ms
	Frame Rate	30 fps	30 fps		Total Packet Lost	0	0
	Jitter	16 ms	16 ms		Packet Lost(%)	0%	0%
	Total Packet Lost	0	0		Resolution	--	--
Packet Lost(%)	0%	0%	Share	Codec	--	--	
Protocol	H.323			Bandwidth	--	--	
Device Info	Yealink VC400 30.23.0.1 38/2			Frame Rate	--	--	

If total packet loss or packet loss rate is high, it is recommended that you check the causes of this problem.

They may be due to network stability, or network congestion caused by network sharing. It is recommended that you use traffic control devices to guarantee the network traffic.