

TOMORROW starts here.



Jabber Everywhere Deploying The Best Experience...

BRKUCC-2480

Paul O'Dwyer, Technical Marketing Engineer



#clmel

Agenda

- Introduction
- Core Deployment
- Features
- Chat Features
- SSO
- What's new in Cisco Jabber Desktop
- What's new in Cisco Jabber for Mobile
- Solution Architecture Including Mobile
- Distributing Cisco Jabber Mobile







- All-in-one UC Application
 - Presence & IM
 - Voice, Video, voice messaging
 - Desktop sharing, conferencing

Collaborate from Any Workspace

- PC, Mac, tablet, smart phone
- On-premises, Remote and Cloud
- Real or Virtual



On Premise Services

- Presence and IM services deployed used on premise model
- Remote Access is available via Mobile and Remote Access or VPN

UC Manager

Call Control

Active Directory

(Options)

Svnc & authentication

Jabber Desktop

(Desk Phone mode)



5

Deployment Flexibility

Start with the features you need



Begin Your Deployment Planning with Directory and UC Infrastructure



Creating Jabber Users



- 1. Setup base infrastructure
- 2. Create/Sync Users in CUCM
- 3. Enable Users for Presence/Client Access
- 4. Configure Contact Source Access
- 5. Configure DNS System for Service Discovery
- 6. Review Jabber Certificate Validation



Jabber Configuration – Configuration Sources



- During start-up Jabber clients will take configuration from multiple sources
- Jabber builds a local configuration which is populated from different sources
- Configuration sources have different priorities with Service profiles highest
- Operating configuration can made up from different configuration sources
- Configuration is created at parameter level
 - e.g. LDAP Host from Jabber-config.xml LDAP user ID from Service profile LDAP password from Service profile



Creating Jabber Users



- Consider your Jabber domain carefully by default JIDs are formed based on "CUCM UID" @ "XMPP domain"
- Jabber 10.6 introduces flexible JID formation
- Multi-modal communications address (Email, IM, Voice, Video & Federation)
- User created on UC Manager (can be synced from LDAP, AD Server)
- User is authenticated (can be authenticated from LDAP/AD/SSO iDP)
- Presence domain is configured on Presence server



Jabber Contact Sources

- Jabber utilises a directory service for a number of purposes
 - Search and add contacts
 - Resolve contact information
 - Resolve phone numbers to display name
- What directory does the organisation use?, Do they use more than one
- Which Jabber Contact Source are we going to deploy



Jabber Contact Sources

LDAP

_ **D** _X

Ċ,

Cisco Jabbe

_ Alan Johnson

Raymond Philips
 Busy
 Larry Marshall
 Offline
 Arlene Smith
 Available
 Jayden Duncan

Patsy Gonzales

Jerry Coleman Away Hannah Hopkin:

😼 🔒 Sean Barrett

WebEx Messenger deployments use a contact service provided by the Messenger cloud

HTTP/REST based contact Source

LDAP based contact Source (EDI or BDI)

Active Directory, AD LDS, Open LDAP

Microsoft Outlook

Custom Contacts (Jabber Windows)

Non directory based contacts stored on IM&P server

MS Outlook Contacts (Jabber Windows) Search local contacts from Jabber

UDS

Jabber Contact Sources

EDI : Enhanced Directory Integration (LDAP)

- On Premise Jabber for Windows by default uses auto-discovery for LDAP directory access (EDI Mode)
- Workstation MUST be a member of a domain for auto discovery to work
- Jabber connects to a Global Catalog server in the current domain (windows selects exact GC, so distributes load)
- Jabber uses encrypted authentication to directory based on current logged on user (workstation)
- Ambiguous name resolution (ANR) is used for search, ANR is more efficient and uses less server resources than other search methods



Jabber Contact Sources EDI : Enhanced Directory Integration (LDAP)



Jabber Contact Sources BDI : Basic Directory Integration (LDAP)

- On Premise Jabber for Mac must use a BDI integration to the LDAP server for directory integration
- BDI uses a common application username and password to access the LDAP server which is used
- BDI configuration is obtained from the jabberconfig.xml
- BDI is also used for Jabber mobile clients





Jabber Contact Sources UDS – User Data Services (Contact Service)



- UDS is an umbrella of web services provided by UC Manager.
- One of the services provided is a directory service
 - Jabber can utilise the UDS directory service instead of an LDAP directory service if desired
 - When Jabber clients are connected via Remote and Mobile Access, UDS directory service will be used by default
 - UDS can be enabled using the jabber-config.xml file or via Service Profile

Can I use UDS as my Contact Source for Jabber?



Adding Users to UC Manager



18

Syncing Users – Setting Directory URI

-Standard User Fields To Be Synchronized					
Cisco Unified Communications Manager User Fields	LDAP Attribute				
User ID	sAMAccountName				
Middle Name	middleName 👻				
Manager ID	manager				
Phone Number	telephoneNumber 👻				
Title	title				
Mobile Number	mobile				
Directory URI	mail 🔹				

-Standard User Fields To Be Synchronized				
Cisco Unified Communications Manager User Fields	LDAP Attribute sAMAccountName			
User ID				
Middle Name	middleName 🔻			
Manager ID	manager			
Phone Number	telephoneNumber 👻			
Title	title			
Mobile Number	mobile			
Directory URI	msRTCSIP-primaryuseraddress 👻			

 When configuring the sync agreement – Directory URI needs to be mapped to an AD attribute

– mail

- msRTCSIP-primaryuseraddress
- This attribute will be used to form
 - SIP URI Address
 - JID if flexible JID is configured
- Note: msRTCSIPprimaryuseraddress is only available in deployments with MS Lync or OCS



Jabber User Configuration – Service Profiles

- Services Profiles detail the configuration and address of UC services
- Service Profiles are configured on CUCM in 9.x and later
 - configured on CUP in 8.6 deployments
- Service profiles can be used to deliver different feature sets
 - Phone mode (No IM & P Service Profile)
 - Full UC Mode
- Directory Service Profile supports basic settings.jabber-config.xml can still be used for more specific directory configurations BRKUCC-2480 © 2015 Cisco and/or its affiliates. All rights reserved. Cisco Public



Adding Users as UC Manager Users

- Assign user to Home Cluster (Service Discovery)
 - This box should be unchecked if user does not reside on that cluster
- Enable IM & P for user (unless phone only mode)
- Assign Appropriate UC Service Profile to user

	- Comvice Cottings						
	Service Settings						
	Home Cluster						
	Enable User for Unified CM IM and Presence (Configure IM and Presence in the associated UC Service Profile)						
	🗹 Include meeting i	nformation in presence(Requires	Exchange Presence G	ateway to be configured on CUCM IM and Presence server)			
I	Presence Viewer for I	<u>User</u>					
	UC Service Profile	All_User_Profile	+	View Details			
I							

Miscellaneous

- Assign device to the user and associate device to user
- Add user to appropriate permission groups
- Enable Mobility (e.g. Extend and Connect)



Syncing Users to IM and Presence



Flexible JID

53 44

0000

.

1.7



Flexible Jabber ID (JID) Structure



- Jabber 10.6 provides the administrator flexibility when defining user JID
- JID can be based on CUCM DirectoryURI which is synced from LDAP
- JID structure becomes independent of UserID (UID) for authentication
- Supported on Windows, Mac, IOS and Android
- Supported with LDAP (BDI/EDI) and UDS contact sources

Flexible Jabber ID (JID) Structure

EXAMPLE: UserID:smillerJID:sue.miller@example.com



Configuring Jabber for Flexible JID

 Jabber needs to be configured to use SIP URI to resolve contacts when flexible JID is used

```
<Directory>
<UseSIPURITOResolveContacts>true</UseSIPURITOResolveContacts>
<SipUri>mail</SipUri>
<BDIUseSIPURITOResolveContacts>true</BDIUseSIPURITOResolveContacts>
<BDISipUri>mail</BDISipUri>
</Directory>
```

 Note that if using msRTCSIP-primaryuseraddress attribute to form the JID, a prefix <u>sip</u>: must be set in the jabber-config.xml so Jabber will add it to the JID when resolving against an AD attribute

<UriPrefix>sip:</UriPrefix>

<BDIUriPrefix>sip:</BDIUriPrefix>



Jabber

client

Flexible Jabber ID (JID) Structure - Summary

- Provides Admin more flexibility over JID definition
- Multiple JID domains in the same deployment are supported
 - <u>first.last@domain1.com</u>
 - <u>username@domain2.com</u>
- Privacy settings for Multiple JID domains are not yet supported
- Simplifies Lync to Jabber Migration UserID management where userid not based on sAMAccountName in Lync deployment.
- Supported with Jabber 10.6 + and IM & Presence 10.0 +

Service Discovery

53

Cm

DODD

17





Jabber Sends HTTP and DNS Queries

- Jabber sends all requests (HTTP request & DNS queries) simultaneously
- Among all returned, the record with the highest priority will be used for connecting to UC services
- Jabber will also evaluate returned responses to determine if it is inside or outside the organisation

Priority	Service	HTTP Request / DNS SRV
1	WebExMessenger	HTTP CAS lookup
2	Unified CM 9.x	_cisco-udstcp. <domain_name></domain_name>
3	Cisco Presence 8.x	_cuplogintcp. <domain_name></domain_name>
4	Cisco Expressway	_collab-edgetls. <domain_name></domain_name>





Jabber Establishes Services Domain

- Jabber needs to establish Services Domain name to send Service Discovery queries
 - Services Domain is usually the WebEx Messenger domain name or UC Manager domain name
- Jabber can establish the Services Domain in a number of ways
 - UPN discovery (Jabber for Windows only)
 - Enduser input
 - Preconfigure (Bootstrapping/MSI transformation or URL Configuration)
 - jabber-config.xml



UPN Discovery

- Jabber for Windows will not prompt user to enter login credentials until the Windows machine is connected to a network
- Once a network connection becomes available
 Jabber will initiate service discovery
- Jabber for Windows will attempt to use User Principal Name (UPN) for service discovery e.g. smiller@example.com example.com is used as the Services Domain (_cisco-uds._ecp.example.com etc)

"smiller" is used for home cluster discovery

- UPN Discovery can be disabled
 - upnDiscoveryEnabled: true/false









Services Discovery Configuration Preconfigure

- Jabber can be pre configured with Services Discovery information for various deployment needs name prior to installation
- Services Domain
 - Used to set domain for discovery
- Voice Services Domain
 - Used to set domain for discovery of SRV records if different to WebEx Messenger domain
- Excluded Services
 - Used to exclude specific services from Service Discovery
 - E.g. organisation may have WebEx Messenger domain but want to enable phone only mode



Services Discovery Configuration Preconfigure

Jabber for Windows can be preconfigured with Services Discovery configuration via bootstrapping or MSI transformation

msiexec /i CiscoJabberSetup.msi SERVICES_DOMAIN=example.com VOICE_SERVICES_DOMAIN=uc.example.com

msiexec /i CiscoJabberSetup.msi SERVICES_DOMAIN=example.com EXCLUDED_SERVICES=WEBEX

 Jabber for Mac can be preconfigured with Services Domain via URL Configuration

ciscojabber://provision?ServicesDomain=example.com&VoiceServicesDomain=uc.e xample.com

ciscojabber://provision?ServicesDomain=example.com&ServiceDiscoveryExcluded Services=WEBEX

Home Cluster Discovery



smiller's homecluster is Cluster 2

- DNS SRV returns a node in Cluster 1
- Jabber connects to node in Cluster 1 and asks for homecluster of "smiller"
- Cluster 1 queries other clusters for "smiller" home cluster via ILS Service and returns Cluster 2 to Jabber
- Jabber connects to Cluster 2 for service



Single Sign On

53 44

0000

17


Single Sign On

Jabber 10.5 supports SAMLv2 based SSO

- Supported in cloud, on premise and hybrid deployments
- Supported with UC Manager 10.5 +
- Jabber users need to authenticate once with an Identity Provider (IdP) to gain authorisation and access to provisioned services
- Users no longer required to provide credentials multiple times for UC services
- Supported IdPs'
 - Ping Federate
 - Microsoft AD Federation Services (ADFS)
 - OpenAM
- Embedded browser (form based), Smart card and Kerberos Authentication supported

BRKUCC-2480 © 2015 Cisco and/or its affiliates. All rights reserved. Cisco Public







Embedded Browser

- When Jabber connects to the IdP, the IdP will provide a web form that will be displayed within an embedded browser (browser within Jabber)
- Automatically resizes
- Returns to original size after authentication
- Authentication process delegated from Jabber to the browser
- Browser will be able to utilise IdP cookie to gain authorisation to other SSO enabled services (e.g. WebEx Meetings)
- The Browser abstracts the client from details of:
 - IdP interaction and re-directs
 - IdP Login Screen
 - Password reset mechanism



OS	Windows	MAC	iOS	Android
Underlying browser technology	IE	Safari	WebKit	WebKit
Control shares cookies with native OS browser	Yes	Yes	NO	NO



SSO Login Flow – Embedded Browser



Ciscolive!

SSO Login - Kerberos

- Authentication based on login to a Windows domain
 - Jabber will automatically sign into services based on authentication between the OS and the IDP



Configure SSO for Jabber



SSO and Mobile Remote Access



Jabber 10.6 supports SSO based authentication when

Cisco Public

Desktop Share

53 44

0000

17



Jabber Desktop Share

- Jabber supports a number of desktop sharing capabilities
 - Video Desktop Share (BFCP) (Jabber Windows and Mac, mobile platforms can receive)
 - IM Only Screen Share (Jabber for Windows)
 - WebEx Messenger Share (Jabber for Windows Cloud mode only)
- A Video Desktop Share captures the desktop and sends the share as a video stream
 - Video Desktop Share requires an active softphone mode call
 - Video Desktop Share is enabled by default and can be disabled using the jabber-config.xml or the SIP profile
 - Interoperable with Jabber, TelePresence and Video Bridges (TPS)
- IM Only Screen Share is available in Jabber for Windows 10.5 +
 - No active call required





IM Only Screen Share

- Screen share from an IM session
 - No requirement for active call
- Support for multiparty screen share up to 1 + 5 participants
- Support for Remote Desktop Control
- Independent of telephony mode
 - Softphone mode and deskphone mode supported
- Protocols & Port Numbers
 - IM Screen share capabilities negotiated through xmpp session
 - IM Screen share media selects a random TCP port ranging from 49152 to 65535



Screen share button



Recipient can accept or decline the share invitation



Which Share is Initiated?

- From an IM Session with another Jabber for Windows user:
 - An IM only based screen share will be initiated
- From an IM session with a Jabber for Mac user
 - A video desktop share will be initiated
- From an active softphone mode call:
 - A video desktop share will be initiated
- If an IM only screen share has been initiated before a call:
 - The IM only based screen share session will be maintained
- IM Screen share enabled by default
 - Can be disabled using jabber-config.xml

<Policies> <enablep2pdesktopshare>False</enablep2pdesktopshare> </Policies>



Video Desktop Share

IM Only Desktop Share

WebEx Messenger Desktop Share



Remote Desktop Control

- IM Only desktop share recipients can request to take control of desktop share initiators remote desktop
- Initiator is prompted to accept the remote control request
- Share recipient can release control
- Initiator can revoke control at any time



Revoke control from Neela Patel



Hunt Groups and Pickup

DODD

53



Hunt Group

- "Hunt Groups enable incoming calls to be directed to a group of users"
- Supported on Jabber for Windows (softphone mode)
- New tab to access Hunt Group Log in/Out checkbox
- Enabled by a jabber-config key

<Options> <EnableHuntGroup>True</EnableHuntGroup> </Options>

 Tab also used for Call Pickup and Group Pickup feature



Call Pickup / Group Pickup / Directed Group Pickup

- Call Pickup allows users to pick up incoming calls within their own group
- Group Pickup allows users to pick up an incoming call to another associated group
- Directed Call Pickup allows users to pick up incoming calls to another group by way of group DN
- Utilises same tab as Hunt Group
- Hunt Group is not a requirement
- Enabled by a new jabber-config key



<Options>

<EnableCallPickup>True</EnableCallPickup>
<EnableGroupCallPickup>True</EnableGroupCallPickup>
<EnableOtherGroupPickup>True</EnableOtherGroupPickup>
</Options>



Pickup a Call



Pickup a call to a user in another group (not associated)

Type the Call Pickup Group Number into the text box and click pickup





Persistent Chat Rooms and File Transfer

12

IN all



Persistent Chat Rooms

- Jabber for Windows Features include
 - Administration
 - Moderation
 - Room Search
 - Notifications
 - Room Password Protection
- Requirements
 - Unified CM IM & Presence 10.0 +
- Database
 - PostgreSQL Database 8.3.x through 9.1.1
 - Oracle 9G, 10G, 11G
 - The database deployment is platform independent (Windows or Linux)



Persistent Chat Rooms Architecture



Jabber for Windows

All Persistent Chat Room messaging is stored on an external database. All messaging (XMPP) is routed from Jabber to the IM & P server. The IM & P server then writes this data to the external database



File Transfer Enhancements

- Jabber 10.6 introduces a new option for file transfer
- New architecture based on IM & P 10.5.2 Managed File Transfer feature
 - File transfers are stored to external file server
 - Audit logs written to external database
 - Feature supported on Jabber for Windows, Mac, Android and IOS
- · Feature includes the following

BRKUCC-2480

- Group Chat support of File Transfer
- Persistent Chat Room support of File Transfer
- Support of Compliance & Policy control of File Transfer
- Admin control of maximum file transfer size
- In pre IM & P 10.5.2 environments, file transfer will revert to point to point model (Jabber for Windows)
- Point to Point based file transfer is available for mixed deployments
 - Can be configured on IM & Presence

File Transfer Architecture





What's New in Cisco Jabber Desktop

BBIN

53



Save Chat to Outlook

- Jabber for Windows 10.6 allows chat history to be automatically stored in a Microsoft Exchange folder which can be viewed through Outlook
 - Jabber connects to Exchange via Exchange Web Services (EWS)
- Supported with Exchange 2010 and 2013
- Jabber can discover Exchange server via
 - Autodiscovery based on Services Domain
 - jabber-config.xml file
 - Manual entry (enduser)
- · Jabber can authenticate with Exchange using
 - OS level SSO
 - Credential Syncing with UC Service
 - Manual authentication (enduser)
- · Feature can be enabled/disabled by an administrator or enduser



Location: Display Current Location

0	Cue Miller					
B ••	Available	Q				
	Cisco Systems - Galway					
Q Searci	h or 🔍	Options				
	General					
	🛶 Chats	Locations				
2	Audio	Using Locations will allow you to display your current lo You can select which of these to share.	cation to others.			
	Video	Use locations				
ontacts	Calls	Prompt me when new locations are discovered				
	Status	My locations				
	Location	201 Cisco Systems - Galway	/0			
	Sounds and Alerts	59¢ Coffee Shop	/0			
oms	Privacy	f 60 Cisco-San Jose	/0			
	Celf Care Portal					
	ation					
5						
12-	1. 12					

- User can assign a Location name, address & time zone for each network* location detected by Jabber to show contacts where they are working.
- Feature can be disabled by both admin and user. User can choose which locations to publish
- Most recent active client will be the published location
- Mobile Jabber location will be @mobile, not geolocation

*Network location - Each unique subnet & Default gateway Mac address pair



Jabber Release 10.6

Jabber for

Windows

Chat & Presence Features

Alert when available Locations Print Chat Save Chat to File Save Chat to Outlook Conversation Tab reordering Conversation Tab switching shortcut (CTRL –TAB) Chat Security Labels [XEP-258] Group Chats – remove participants Chat Room Passwords

Telephony Features

Calls – Do Not Disturb Call notifications on other device Early Mute – mute before answer Call Statistics Menu item Audio Device selection Ring on all devices

Share Enhancements

New share menu (Webex & screen share) File transfer size limit File Attachments in Group Chats (on prem) File Attachments in Chat Rooms (on prem) File transfer compliance & audit

Admin & User Management

Single Sign On for Remote Access Mandatory Upgrades [10.5.2] Flexible Jabber ID (JID) Structure

Security

US Federal Market - FIPS 140-2 Compliance Information Assurance improvements



⁾ Jabber Release 10.6

Jabber for Mac

Chat & Presence Chat Themes

Share Enhancements

File transfer size limit File Attachments in Group Chats (on prem) File Attachments in Chat Rooms (on prem) File transfer compliance & audit

Telephony Phone mode Custom Contacts

Admin & User Management

SSO for Remote Access Flexible Jabber ID (JID) Structure 64 Bit Mac



What's New in Cisco Jabber for Mobile

53



What's New in Jabber 10.5 for Mobile

- SAMLv2 Single Sign-On (SSO)
- Phone-only mode
- More Android smartphones & tablets
- HD quality video on iPhone & iPad
- Answer hunt group calls
- Visual design refresh
- Reset Jabber
- Telemetry service support



What's New in Jabber 10.6 for Mobile

- SAMLv2 SSO over Cisco Expressway
- Flexible Jabber ID (JID) & multiple IM address domain support
- File transfer with 3rd party cloud storage system integration
- BFCP-based desktop sharing (receive only on tablets)
- Answer without unlocking on iOS
- Real-time audio/video statistics

- Call Park
- SRST Failover
- More smartphones & tablets (including iPhone 6 & 6 Plus)
- Cisco DX Series support

New Android tablets: Samsung Galaxy Tab Pro 8.4 & 10.1 Samsung Galaxy Tab S 8.4 & 10.5 Samsung Galaxy Tab 3 8.0 Samsung Galaxy Tab 4 7.0, 8.0 & 10.1

Google Nexus 7 Sony Xperia Z2 Tablet Cisco DX Series

64

New Android smartphones: Samsun Galaxy S5 Mini Samsung Galaxy Note 4 Sony Xperia Z3 HTC One Max HTC One M7 & M8 LG G3

Android 5.0 Lollipop support



Available Today

Solution Architecture Including Mobile

53

in shi



Cisco Jabber On-Premises Deployment



Cisco Jabber Hybrid Deployment



Device Type in Unified CM

Platform	iPad & Android Tablet w/o Cellular Voice Capability	iPhone	Android Smartphone & Tablet w/ Cellular Voice Capability
Product Type	Cisco Jabber for Tablet	Cisco Dual Mode for	Cisco Dual Mode for
(Device Type)		iPhone	Android
Device Protocol	SIP	SIP	SIP
Device Name	TAB <userid></userid>	TCT <userid></userid>	BOT <userid></userid>
	e.g. TABKJONES	e.g. TCTKJONES	e.g. BOTKJONES
COP File	A COP file is required for	A COP file is required for	A COP file is required for all
	all supported versions of	all supported versions of	supported versions of
	Unified CM	Unified CM	Unified CM

File Transfer in Cisco Jabber 10.6 for Mobile

- Users can share photos, files & screen captures
- In a 1:1 chat or a group chat*
- Integration with 3rd party cloud file storages
- Save received files on mobile devices
 - Android received files in SD card
 - iOS sent/received files in Jabber app folder
- File transfer events can be logged for compliance purpose*







* File transfer in group chats & compliance logging require Managed File Transfer turned on.

Distributing Cisco Jabber for Mobile

BBIN

53



Where to Find the Latest FCS Software

- Cisco Jabber is a free download
- Recommended that end users download/upgrade directly from App Store or Google Play Store
- 3rd party MDM/MAM* solution may be used to wrap/distribute Jabber within the organisation

* MDM (Mobile Device Management) / MAM (Mobile Application Management)



Community Based App Wrapping Support

- Looking to building out an on-line community in Customer Connection Program (CCP) to support for Jabber wrapping
- Distribute software outside of App Store while staying in Apple's developer license agreement
- For customers & partners (invitation only)
- Starting with several leading MAM/MDM makers but plan to expand to cover more vendors

Key Takeaways

- Cisco Jabber can provide the core UC features with video on most commonly used mobile devices
- Cisco Jabber can be deployed either on-premise or in the cloud
- Cisco Jabber is flexible, and can operate in three different modes: full UC, phone-only & IM-only
- User Experience is the main focus for Cisco Jabber. Delighting the end-user!









Call to Action

- Visit the World of Solutions for
 - Cisco Campus Collaboration area
- Meet the Expert
 - Paul is available this week for meet the expert
- www.linkedin.com/in/odwyerpaul



Q&A

53

l con

DODD

PREM

-

17



.....

Complete Your Online Session Evaluation

Give us your feedback and receive a Cisco Live 2015 T-Shirt!

Complete your Overall Event Survey and 5 Session Evaluations.

- Directly from your mobile device on the Cisco Live Mobile App
- By visiting the Cisco Live Mobile Site
 <u>http://showcase.genie-connect.com/clmelbourne2015</u>
- Visit any Cisco Live Internet Station located throughout the venue

T-Shirts can be collected in the World of Solutions on Friday 20 March 12:00pm - 2:00pm



Learn online with Cisco Live! Visit us online after the conference for full access to session videos and presentations. <u>www.CiscoLiveAPAC.com</u>





Thank you.



#