



DEPLOYING UNIFIED COMMUNICATIONS AND LEGACY VOICE MAIL AND PBX INTEGRATIONS

SESSION VVT-2104

Recuerde siempre:



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E

 Apagar su teléfono móvil/pager, o usar el modo "silencioso".



 Completar la evaluación de esta sesión y entregarla a los asistentes de sala.



 Ser puntual para asistir a todas las actividades de entrenamiento, almuerzos y eventos sociales para un desarrollo óptimo de la agenda.



 Completar la evaluación general incluida en su mochila y entregarla el miércoles 8 de Junio en los mostradores de registración. Al entregarla recibirá un regalo recordatorio del evento.

Agenda

- What Is Unified Communications
- Cisco Unity[™] Architectural Overview
- Planning a Unity Deployment
- Voice Mail Interoperability
- Legacy PBX Interoperability
- Q&A



WHAT IS UNIFIED COMMUNICATIONS

What Is Unified Communications...



What Is Unified Communications...



CISCO UNITY ARCHITECTURAL OVERVIEW



Cisco Unity Architecture Component View: Exchange Message Store



Cisco Unity Architecture Server View: Exchange Message Store



Cisco Unity Architecture Client View: Exchange Message Store



Active Directory Exchange 2000 Topology



Unity Call Flow with Microsoft Exchange



Cisco Unity Architecture Component View: Domino Message Store

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IBM/Lotus Domino Cisco Unity UNITY FOR EXCHANGE **DOMINO SERVER Domino Directory** Conversation Dir Server **Unity Message Repository Domino Router** Administrator NRPC Web-Based **Message Store System Admin** SQL or MSDE Console **Notify** NRPC **Notification Monitor PSTN** IP 8 / 10 B B B-LAN **SER Client PC with** æ IP Cisco ≡ IP 00000000 0 ···· Notes or CallManager(s) Legacy **iNotes Client** PBX

Domino Unified Communication Services

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- DUCS is the API glue in the Unity Domino product
- DUCS components include:

CS Admin (installed on administration server) CS Server (installed on message store servers) CS Client (installed on each Notes/iNotes client)

- Unity leverages Address Book changes and populates the fields with Unity and subscriber data
- Unity's Domino monitor periodically looks for changes to the Domino Address Book on its Domino Partner server
- DUCS is an IBM product

Cisco Unity Architecture Server View: Domino Message Store



Cisco Unity Architecture Client View: Domino Message Store

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Domino Domain and Messaging Topology

Domino Domain Domino Messaging HUB/Admin Server Domin **IAmerica's IEmea** Message Message Routing Server **Routing Server IAsia PAC** Domir Message **Domino Message** Routing Store **Domino Message** Server/ **Store** Directory Server **Domino Message** Store U **Unity Server**

Unity Call Flow with Lotus Domino





DEPLOYING UNIFIED COMMUNICATIONS

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Build the Correct Team

- Messaging team
- Domain/directory team
- Client/desktop
- Voice team
- Storage team
- Networking team



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Where Do You Start?

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- What is the size of your voice messaging solution today?
- Do you use Automated Attendant?
- What Messaging Groupware do you use?
- What is the size of the messaging infrastructure today?
- Who will you partner with? Unified Messaging touches everything

Telephony/IP telephony/Groupware/Cisco infrastructure

Deployment Considerations

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Factors to Consider Include:

- Total subscriber count
- Total server count
- Hardware selection
- Voice mail storage
- Deployment tasks
- Survivability/failover
- Voice mail interoperability
- Current network and groupware design

Unity Subscriber Provisioning

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How Many Unity Servers Do I Need?

- Number of subscribers
- Number of sites
- Domino domains
- Number of message stores
- PBX layout
- WAN connections



Single Site Deployments Voice Messaging Only with Exchange Only

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- 72 sessions maximum
- 7500 maximum supported users
- Exchange 2000 is the ONLY supported new message store for voice mail only
- Microsoft Exchange 2000 on the Cisco Unity server (up to 4000 mailboxes on PO #3 hardware)
- Microsoft Exchange 2000 off box when scaling above 4000 users
- Up to 4000 users supported on a single store (regardless of where the store resides)
- Up to 7500 users supported on offthe-box message stores (no users homed on the Cisco Unity server once you scale above 4000)
- Multiple CM clusters supported from 3.1 onwards with RDNIS

Exchange Messaging Servers



Single Site Deployments Unified Messaging with Exchange or Domino

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- Microsoft Exchange or Lotus Domino must be installed off box (no more on box UM)
- Microsoft Exchange 5.5,2000 and Domino 5.10 supported for Unified Messaging
- 72 sessions
- 7500 users supported on Exchange or Domino message store per Cisco Unity server, up to 250,000 (Exchange) 100,000 (Domino) users supported with multi-Unity servers networked

Exchange Domino Messaging Servers



Current Messaging Design

- Platforms and software versions
- Location of message stores
- Message store routing
- Clustering of messaging servers

Type of Message Stores



- Exchange 2000 is always used for VM
- Exchange 2000 or 2003 for UM
- Exchange 5.5 for UM



- No Voicemail only support
- Domino 5.10-5.12 or Domino 6.0-6.5
 - On Windows /AIX platform only at this time
- Requires DUC

Location of Message Stores

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- Understand where the partner server is
- Partner server should always be on the same LAN
- Partner should be using the same Directory Services

Same DC/GC for Exchange

Each Unity should only service a single Exchange 2000 administrative group

Clustering of Messaging Servers

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Unity can support Exchange 2000/2003 clusters:

Active/Active (connect to virtual server)

Active/passive

VPIM/AMS caveats

Storage Considerations

- Message store
- Recording format
 - G.711 Codec
 - G.729 Codec (Commercial Codec!)
- Trans-coding
 - Unity
 - Network
- Active Directory



What Is the Storage Requirement?

White Paper on the Web

				Cisco.com
Users	Messages		Ave. Msg. Size in Sec.	Storage Size G.711
1	15		Ave. Msg. Size in Sec. Storage Size G.711 40 4,800,000 40 4,800,000 40 4,800,000 40 4,800,000 40 4,800,000 40 4,800,000 40 4,800,000 40 2,400,000,000 40 4,800,000,000 40 4,800,000,000 40 3,600,000,000 40 24,000,000,000 40 24,000,000,000 40 36,000,000,000 40 48,000,000,000 40 48,000,000,000 40 48,000,000,000 40 6,000,000 40 6,000,000 40 6,000,000 40 6,000,000 40 6,000,000 40 6,000,000 40 6,000,000 40 6,000,000 40 6,000,000 40 6,000,000 40 6,000,000 40 9,00,000,000 </td	
10	15	G.711 @ 8k per Sec	40	48,000,000
100	15		40	480,000,000
500	15		40	2,400,000,000
1,000	15		40	4,800,000,000
1,500	15		40	7,200,000,000
2,000	15		40	9,600,000,000
5,000	15		40	24,000,000,000
7,500	15		40	36,000,000,000
10,000	15		40	48,000,000,000
Users	Messages		Ave. Msg. Size in Sec.	Storage Size G.729a
1	15		40	600,000
10	15	G.729a @ 1k per Sec	40	6,000,000
100	15		40	60,000,000
500	15		40	300,000,000
1,000	15		40	600,000,000
1,500	15		40	900,000,000
2,000	15		40	1,500,000,000
5,000	15		40	3,000,000,000
7,500	15		40	4,500,000,000
10,000	15		40	6,000,000,000

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Deployment of Cisco Unified Messaging Requires Extensions to Directory Services/Databases



Microsoft Exchange

Active Directory is extended during **Unity installation**

Exchange 5.5 uses custom attributes

Native and Mixed Mode



Lotus Domino

NAMES.NSF is extended by the Lotus **DUC when installing CsAdmin**

Microsoft Active Directory

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Unity Extends AD as Follows



- Extends users class
- Extends groups class
- Extends contacts class
- Creates locations class

Microsoft Active Directory



- Unity will check AD for changes and update local data store
- Unity and partner server should share same DC/GC
Unity Networking Exchange 2000 Native Mode

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The Location Class Enables Unity Networking



Unity Networking Exchange 5.5 Native Mode

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The Location Class Enables Unity Networking



Unity Networking: Mixed Mode

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Domino



- Unity does not directly extend Domino
- DUC makes the following extensions DUC extends the Domino Address Book DUC Client UM enables the Mail File

Unity Networking Lotus Domino



Domino

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• A single Cisco Unity server is fully functional for:

A single physical site with up to five Domino servers or clusters (with DUCS installed)

A single Domino Directory or Names.NSF file

A secondary address book for contacts with the same views as normal address book

• Digitally networked Cisco Unity servers are fully functional in a single Domino Domain/Directory

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Centralized Call Processing

- One Cisco Unity supports multiple CallManager cluster
- Cisco Unity should be deployed within the same LAN as Microsoft Exchange/ Lotus Domino
- Cisco Unity supports Transcoding of G711 and G729a
- QoS and WAN design



Centralized Cisco Unity

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Distributed Call Processing Deployments



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Cisco Unity depends on the infrastructure into which it is installed, so careful design consideration must be given to the amount of network traffic and the bandwidth available to Cisco Unity

- QoS-enabled
- Highly available



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VOICE MAIL INTEROP



Cisco Unity Voice Message Interoperability

	AMIS	Unity Bridge	VPIM
Voice Mail Supported	 PhoneMail Meridian Mail Repartee, Octel 100, 250, and 350 Intuity Interchange Centigram 	 Avaya/Octel Unifed Messenger Octel 100, 250, and 350 Intuity Interchange 	 Meridian Net Gateway for Meridian Mail Centigram Nortel CallPilot Intuity Interchange
Pros	Widely supported and understood for legacy voicemail systems	Analog Octel Networking, Advanced Msg, and Directory Sync	Digital, industry standard, efficient
Cons	Basic subscriber to subscriber messaging only, no directory sync	No digital networking, no extended absence greeting across Bridge, limited to Octel/ Intuity Interchange	No directory sync, not widely adopted or supported for legacy voicemail systems

AMIS

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• AMIS

Support for Audix, Centigram, Meridian Mail, PhoneMail, and others...

AMIS Bridgehead Model

Digital Network multiple Cisco Unity systems

Dedicated Cisco Unity for AMIS traffic

Home Internet subscriber and AMIS users on that Cisco Unity

May need a dedicated Unity based on traffic

Cisco Unity: AMIS-A



VPIM

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Voice Profile for Internet Mail

- Available with Unity 4.01
- Voice enabled SMTP message
- Sent as an email

- Interoperability with disparate systems
- Efficient use of resources
- Immediate message delivery
- Easy to administer

Cisco Unity: VPIM



- Messages marked urgent when they are sent are marked urgent when they are retrieved by the recipient
- Messages marked private when they are sent are marked private when they are retrieved by the recipient
- Subscribers can send messages to Cisco Unity distribution lists that include VPIM subscribers
- Subscribers can send fax messages, if this is supported by the remote voice messaging system

VPIM Caveats

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Lack of Universal Functionality

- Directory sync
- Name dialing
- 200 messages per session

VPIM Integration's Validated

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Nortel Meridian Mail

Requires Meridian Mail Net Gateway

- Nortel CallPilot
- Mitel/Baypoint NuPoint Messenger Formerly Centigram Series 6
- Avaya Interchange

Cisco Unity Bridge

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• Two strategies:

- Migration from Octel environment to Cisco Unity, three months to a year—larger user population is on Octel system
- 2. Coexistence environment, one year and beyond equal number of users on Cisco Unity and Octel

• Design issues:

One Cisco Unity required per Cisco Unity Bridge

Analog networking to Octel networking

Cisco Unity Bridge Design

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• Design scenarios:

Basic Octel networking Multi-node Octel networking

Design considerations:

Maximum of 24 ports per Cisco Unity Bridge server

Selecting physical location of Cisco Unity Bridge server

Possible Octel re-programming

Networked Cisco Unity Servers must have a uniform dial plan

Basic Octel Networking



- Digital or analog networking
- Peer-to-peer topology
- Each node is assigned a serial number below 65535
- Directory sync when messages are sent between users

Basic Cisco Unity Bridge Networking



- Single node replacement
- Analog networking only
- Peer-to-peer topology
- Each node is assigned a serial number below 65535
- Directory sync when messages are sent between users

Basic Cisco Unity Bridge Networking with a Remote Bridge



- Uses WAN to bypass PSTN
- Each node is assigned a serial number below 65535
- Directory sync when messages are sent between users

Multi-Node Octel Networking



Cisco Unity Bridge in Multi-Node Octel Networking (1)



Cisco Unity Bridge in Multi-Node Octel Networking (2)

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Octel Node #3001

Octel Node #4001

Unity Bridge Node #1001

- Multi-node replacement
- Multiple Unity Bridge servers
- Analog networking only
- Mesh topology
- Each node is assigned a serial number below 65535
- Directory sync when messages are sent between users

PSTN

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Cisco Unity Bridge in Multi-Node Octel Networking (3)



Directory sync when messages are sent between users

Cisco Unity Bridge in Multi-Node Octel Networking (4)



• Directory sync when messages are sent between users

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Cisco Unity Bridge with Dual Integration



Cisco Unity Bridge with Cisco CallManager



Unity Bridge Design Considerations

- Placement of the Internet Voice Connector
- Location of the Unity Bridge
- Dial plan for all Octel Systems
- Is Aria Networking used
- Migration plan
 - Collapse a node Collapse a partial node
Unity Bridge Messaging Features

- Messages marked urgent when they are sent are marked urgent when they are retrieved by the recipient
- Messages marked private when they are sent are marked private when they are retrieved by the recipient. (Note however that private messages from both Cisco Unity and Octel subscribers can be forwarded from Outlook, though a private message cannot be modified)
- The future delivery of messages to Octel recipients is supported
- Cisco Unity subscribers can send messages to Cisco Unity distribution lists that include Bridge subscribers
- A message from a Cisco Unity subscriber addressed to multiple Octel recipients who are on the same Octel server is transmitted once to the Bridge. If all of the recipients are on the same Octel node, the Bridge makes only one phone call to the node and transmits only one message, which then is delivered to each recipient. If the recipients are on multiple Octel nodes, the Bridge makes only one phone call to each node and transmits only one message, which then is delivered to each recipient on that node
- Fax messages can be sent, depending on Octel support

Unity and Avaya Interchange

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Unity Bridge and Avaya Interchange

- Use Analog Octel Networking
- Share Directory Information
- Use MBUPLOAD to populate Unity DB

Unity Bridge and Avaya Interchange Design Considerations

- What systems are behind Interchange
- Does all voice messaging traffic route through Interchange
- What is the numbering plan for Interchange 4–10 digits
- How do users address messages to Interchange

Caveats

- Supported with Exchange 2000/2003 only
- Remote Octel users must be Cisco Unity Bridge subscriber before adding to Cisco Unity distribution list
- No Cisco Unity Bridge "demo" mode supported
- Address search scopes on Cisco Unity are limited to Local, Dialing Domain and Global—none of which may correlate to desired Cisco Unity Bridge deployment
- Use Unity Bridgehead for large message traffic

Useful Links

Cisco.com

Networking in Cisco Unity

http://www.cisco.com/univercd/cc/td/doc/product/voice/c_u nity/unity40/net/net404/index.htm

Unity Bridge Networking Guide

http://www.cisco.com/univercd/cc/td/doc/product/voice/c_u nity/bridge30/bnet/bnet30/bnet001.htm#wp1450697

Unity Bridge Design Guide

http://www.cisco.com/univercd/cc/td/doc/product/voice/c_u nity/design/bdg/

LEGACY PBX INTEGRATIONS



Cisco Unity/Cisco CallManager Integration



Cisco Unity Dual Switch Integration



PBX IP Media Gateway (PIMG)

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• 8-port box, OEM from Intel

Provides digital integrations to many TDM PBXs

Increased feature set

Some PBXs don't offer analog integrations, this expands addressable market

Doesn't require customers to put analog cards into their digital PBXs!

SIP connection to Unity

Doesn't require voice cards in Unity server

Can remotely connect to PBXs across the WAN

No longer limited to the effective length of an analog line Can backhaul SIP signaling across the WAN

PIMG



- 8 port box we will OEM from Intel
- Digital or analog phone set connection to various PBXs
- SIP connection to Unity

PIMG

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• Supported PBXs

Siemens HiCom 300

- **Nortel Meridian 1**
- Avaya Definity G3

Cisco Unity (PIMG) SIP/TDM **Switch Integration**

Cisco Unity Digital Handset Server Emulation Gateway Exchange/Domino Legacy **Message Store PBX Legacy Phone** E-1 Line **PSTN** Router **Workstation** with Outlook Cisco **IP** Phones CallManager VVT-2104

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 Allow interoperability between Cisco Unity and QSIG or DNPSS signaled PBX network

Leverage existing EGW/PGW and Cisco IOS[®] signaling technology

Enable insertion of Unity into legacy PBX networks in EMEA/LATAM

Use "dual switch integration" capability of Unity as key part of TDM to IP migration strategy

Offer more scalable integration options

T1/E1 interface via Cisco IOS gateways

 Offer the solution in a form factor and price point suitable for Enterprise market

Utilize Cisco MCS servers and Linux OS

QSIG Architecture Using EGW



- Calls are forwarded to voice mail on Unity from legacy PBX
- Uses SIP REFER method for auto-attendant on Unity
- Uses SIP NOTIFY method for MWI
- Allows E1 connectivity via Cisco IOS GWs
- Backhauls QSIG or DPNSS over either RUDP or SCTP

QSIG Architecture Using Cisco CallManager



- Calls are forwarded to voice mail on Unity from legacy PBX
- Unity Registered to CCM
- CCM Interoperates with PBX vi QSIG

Rolm Gateway

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• OEM from Intel

DSE cards in a server

Provides integrations to Rolm 9751 v9005

These are large, old PBXs...ripe for migration

There are no analog integrations to these PBXs

Digital/SMDI integrations

Digital from PBX to GW, SMDI from GW to Unity for signaling

Still requires analog cards for voice path

Rolm Integration Gateway



Supported Telephone Systems

- Alcatel 4400 (DTMF)
- Avaya Definity G3 (DTMF)
- Avaya Definity Gx (PBXLink)
- Avaya Definity ProLogix (DTMF)
- Avaya Merlin Legend (DTMF)
- Cisco CallManager 3.0,3.1,3.2,3.3,4.0,4.1 (IP)
- Cisco CallManager Express 3.0
- Cisco SIP Proxy Server (SIP)
- Centrex (Serial)
- ECI Coral III (Serial)
- Ericsson MD-110 (Serial)
- Fujitsu 9600 (Serial)

Supported Telephone Systems

- Intecom E14 Millenium (Serial)
- Intecom IBX S/80 (Serial)
- Matra 6500 (DTMF)
- Mitel SX-200,SX-2000 (DTMF) ONS
- NEX NEAX 2000, 2400 (Serial) MCI
- Nortel Meridian 1 (PBXLink)
- QSIG/DPNSS with EGW 2200
- Siemens 9751 9006i (DTMF)
- Siemens Hicom 300 (DTMF)
- Siemens Hicom 300 (Digital)
- Syntegra ITS (Serial)
- Teltronics 20-20 LX (DTMF)
- Toshiba CTX 670 (Serial)

Recommendations and Q&A

- Follow design guidelines closely
- Leverage the Unity Design Guide:
 - http://www.cisco.com/en/US/products/sw/voicesw/ps2237/p roducts_implementation_design_guide_book09186a008011 87ba.html
- Understand how the Cisco Unity UMR and failover fit into your environment
- Plan for future growth
- Leverage existing messaging infrastructure
- Leverage interoperability for migration pathway

Useful Links

Cisco.com

ECSBU (Unity's Website)

http://www.cisco.com/en/US/products/sw/voicesw/ps2237/i ndex.html

Unity documentation homepage

http://www.cisco.com/univercd/cc/td/doc/product/voice/c_u nity

• IP Telephony Steps to Success

http://www.cisco.com/partner/WWChannels/technologies/IP T/index.html

Useful Links

Cisco.com

Cisco Voice forums

http://forums.cisco.com/eforum/servlet/NetProf?page=Voic e_and_Video_discussion

ECSBU Unity application team

http://www.ciscounitytools.com

Unity software download

http://www.cisco.com/kobayashi/sw-center/sw-voice.shtml

Product upgrade tool (SASU)

http://tools.cisco.com/gct/Upgrade/jsp/index.jsp

Unity support page

http://www.cisco.com/pcgibin/Support/PSP/psp_view.pl?p=Software:Unity

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DESIGN STEPS (AS AN ADDED BONUS)

Design Steps

- Presales phase
- Planning phase
- Design
- Implementation
- Operations management/Day Two

Presales

THIS SECTION COVERS THE UPFRONT WORK. THIS IS A CRITICAL PHASE WHERE WE COLLECT **REQUIREMENTS**, BEGIN **DISCOVERY**, LOOK AT THE ENVIRONMENT AND LAY THE FOUNDATION FOR A GOOD DESIGN

Presales Phase

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Requirements Development

Exchange or Domino

What version

If Domino, what is the OS Messaging topology Mail clients

- Is it UM or VM
- Legacy, CCM, or both

Voice mail interoperability

Octel?

Nortel?

Other?

- How many users
- How many ports
- Special feature requirements

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Presale (Cont.)

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Preliminary Design

How many servers

Location of mailstores

Message stores for large VM

• BOM

Preliminary based on above information

Planning

THE PLANNING PHASE IS WHERE WE COLLECT ADDITIONAL DATA. THIS IS THE PHASE WHERE WE DETERMINE EXACTLY HOW UNITY IS TO BE DEPLOYED, COLLECT USER INFORMATION AND ALL THE DETAILS ABOUT THEIR CURRENT ENVIRONMENT, HOW VOICE MAIL IS USED AND BEGIN TO SET THE PROPER EXPECTATIONS ON HOW UNITY WILL DIFFER FROM THE CURRENT ENVIRONMENT.

Planning Phase

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Usage analysis

How is VM used

Interop

How many nodes

How is it used

Broadcast messages

Distribution lists

Feature/function evaluation

Feature parity

Same functionality

Surveys

Departments

Executives

Administrative Assistants

Planning (Cont.)

- Demo/lab/pilot
- Capacity planning
 - Message traffic
 - Port usage
- Final BOM

Final Design and Implementation

THE FINAL DESIGN AND IMPLEMENTATION PHASES ARE WHERE WE PUT TOGETHER WHAT THE END RESULT IS. IF WE FOLLOW THE **STEPS** IN THE PREVIOUS PHASES THERE SHOULD BE NO **DISCOVERY** TAKING PLACE DURING THIS PHASE.

Final Design Phase

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Detail design

Exact location of Unity Server

Ports and users defined

Capacity planning complete

Determine Day One support

Preliminary Day Two Support Plan in place!

Low-level design

How will Unity look

Day One and Two plans in place

Implementation

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Detailed Implementation Plan

- Schedule training, training, and more training
- Schedule DUC install (Domino)
- AD Schema (Windows)
- Day One plan
- Fallback plan

Complete Your Online Session Evaluation!

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Por favor, complete el formulario de evaluación.

Muchas gracias.

Session ID: VVT – 2104

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