



Cisco Expo
2009

Unified Communications solutions update



Migration to mobility - **Vedran Hafner, vehafner@cisco.com**

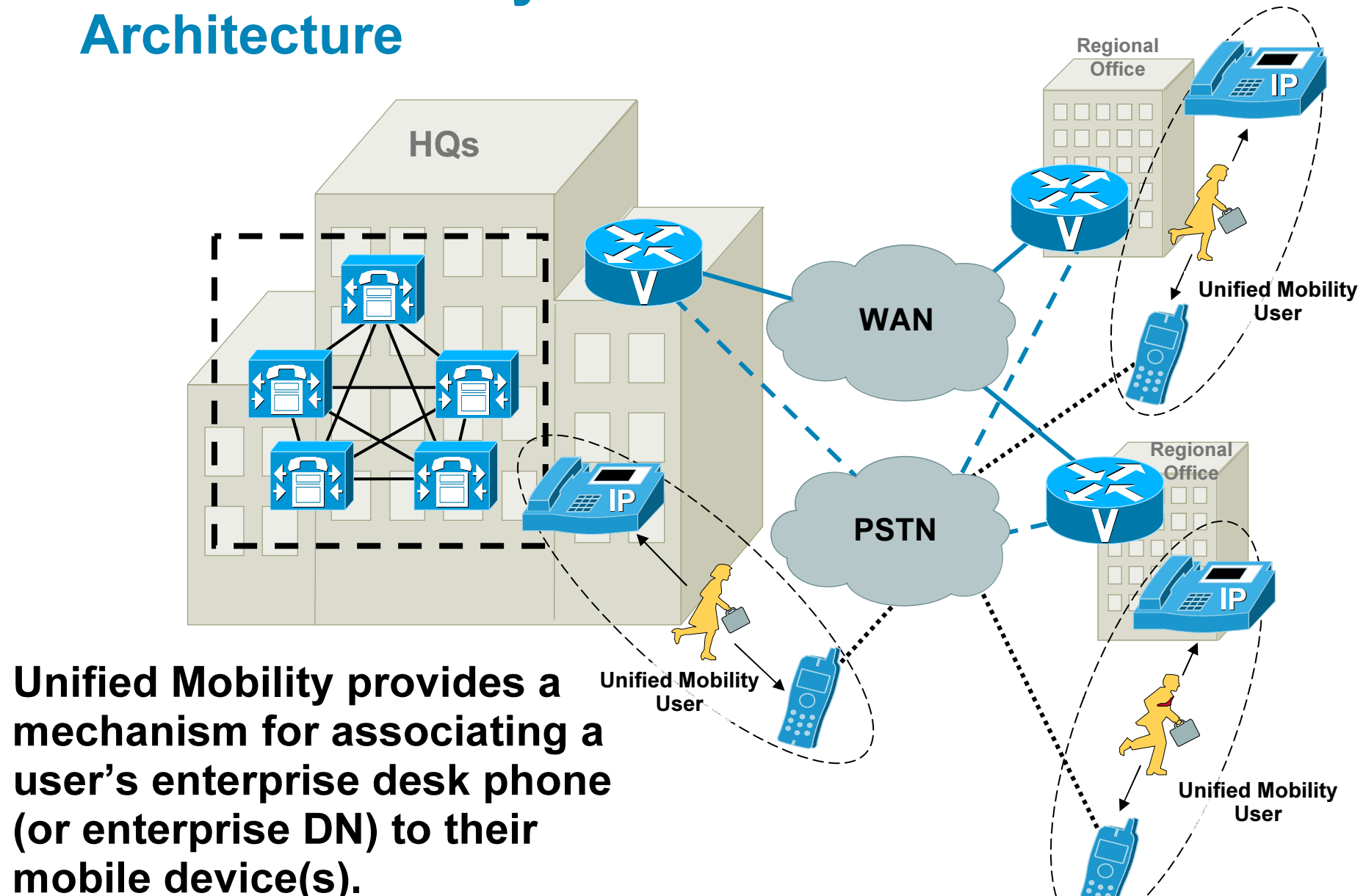
Agenda

- **Step 1: Deploying/enabling Cisco Unified Mobility**
- **Step 2: Deploying dual-mode phones** (Nokia Call Connect)
- **Step 3: Deploying Cisco Unified Mobile Communicator**

Deploying and Enabling Unified Mobility

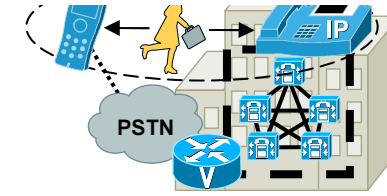


Unified Mobility Architecture



Unified Mobility

What Does It Include?



Unified Mobility provides the following features and functionality:

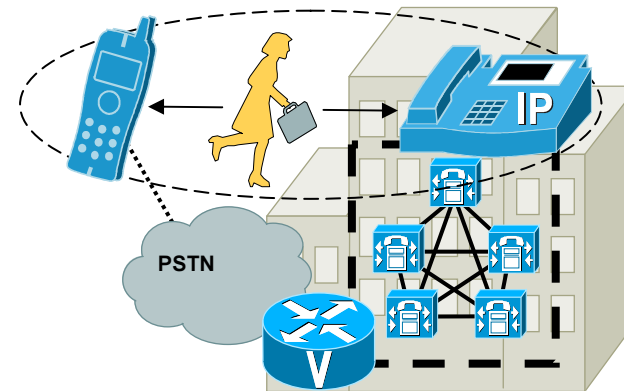
- **Mobile Connect (also referred to as Single Number Reach).**
- **Mobile Voice Access (MVA) – IVR based 2-stage dialing.**
- **Enterprise Feature Access (EFA) – Non-IVR based 2-stage dialing.**
- **Desk and Remote Destination pickup.**
- **Single Enterprise Voicemail Box.**
- **Mid-call features (via DTMF feature access codes).**
- **Mobile Connect on/off toggle (via MVA, EFA, CUCM User Options pages, and Desk phone*)**
- **Time of Day Access Lists* – Allow or block call extension to configured Remote Destinations.**

*** New in CUCM 7.0**

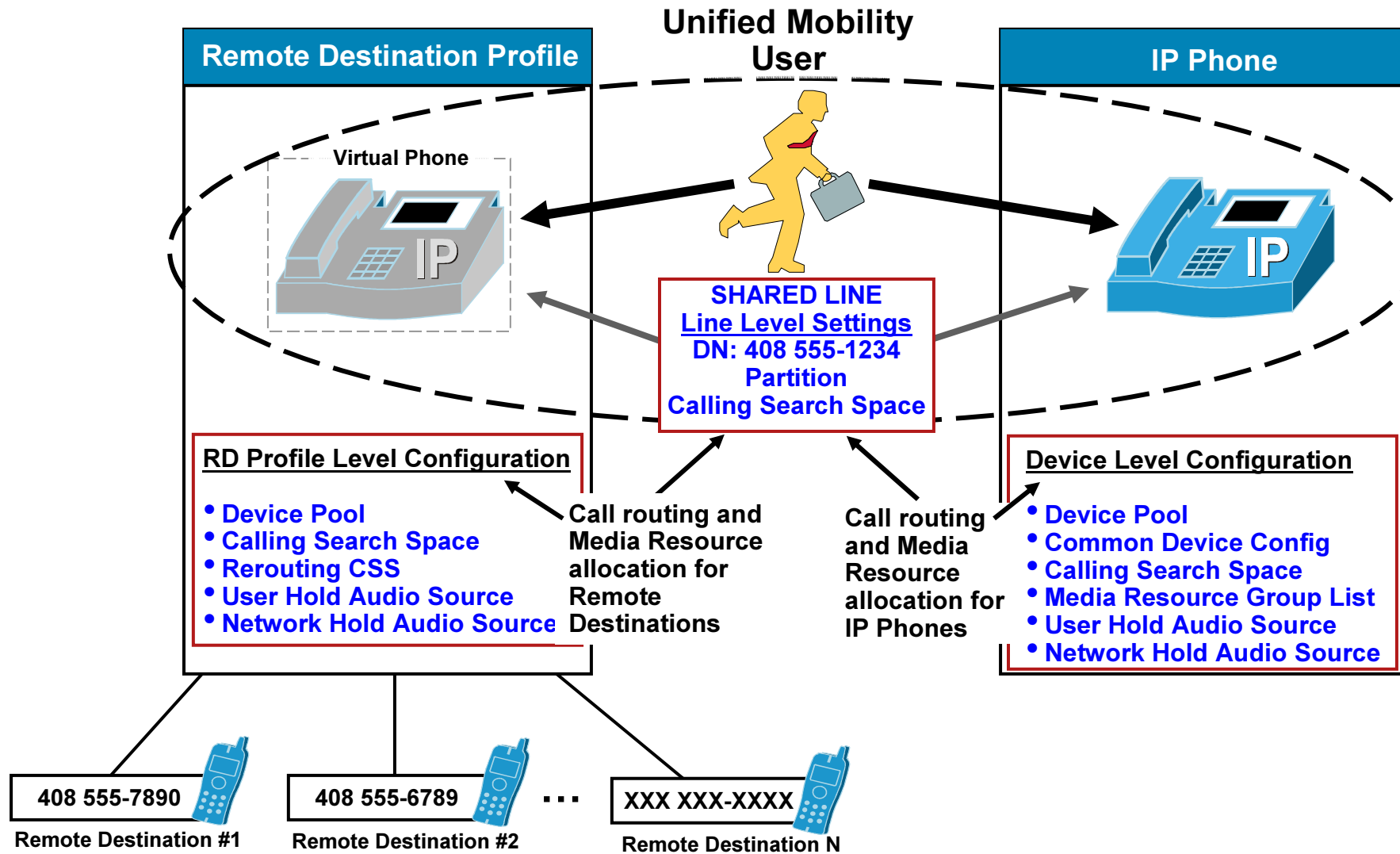
Unified Mobility - What Will It Cost?

Company XYZ will incur the following additional costs for enabling Unified Mobility:

- Two (2) Device License Units (DLUs) **per mobility-enabled user** with an associated desk phone.
- Four (4) DLUs **per mobility-enabled user** without an associated desk phone (no desk phone or extension mobility user).
- Increased PSTN utilization.



Unified Mobility Configuration and Call Routing Concept



Unified Mobility

Design Considerations: Scalability

Cisco Unified Mobility supports the following capacities:

	Mobility-enabled Users per CLUSTER	Mobility-enabled Users per NODE
MCS-7845	15,000	3,750
MCS-7835	10,000	2,500
MCS-7825	4,000	1,000

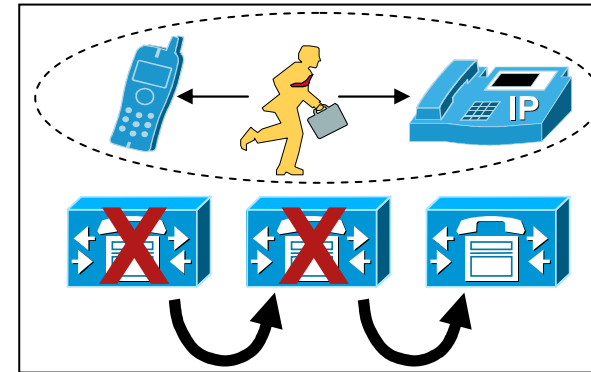
- Mobility-enabled user: A user that has a RDP and at least one RD configured.
- Capacity numbers are based on a **SINGLE** RD per user.

Verify Unified Mobility and overall system capacity using the CUCM Capacity Tool: <http://tools.cisco.com/cucst/>

Unified Mobility

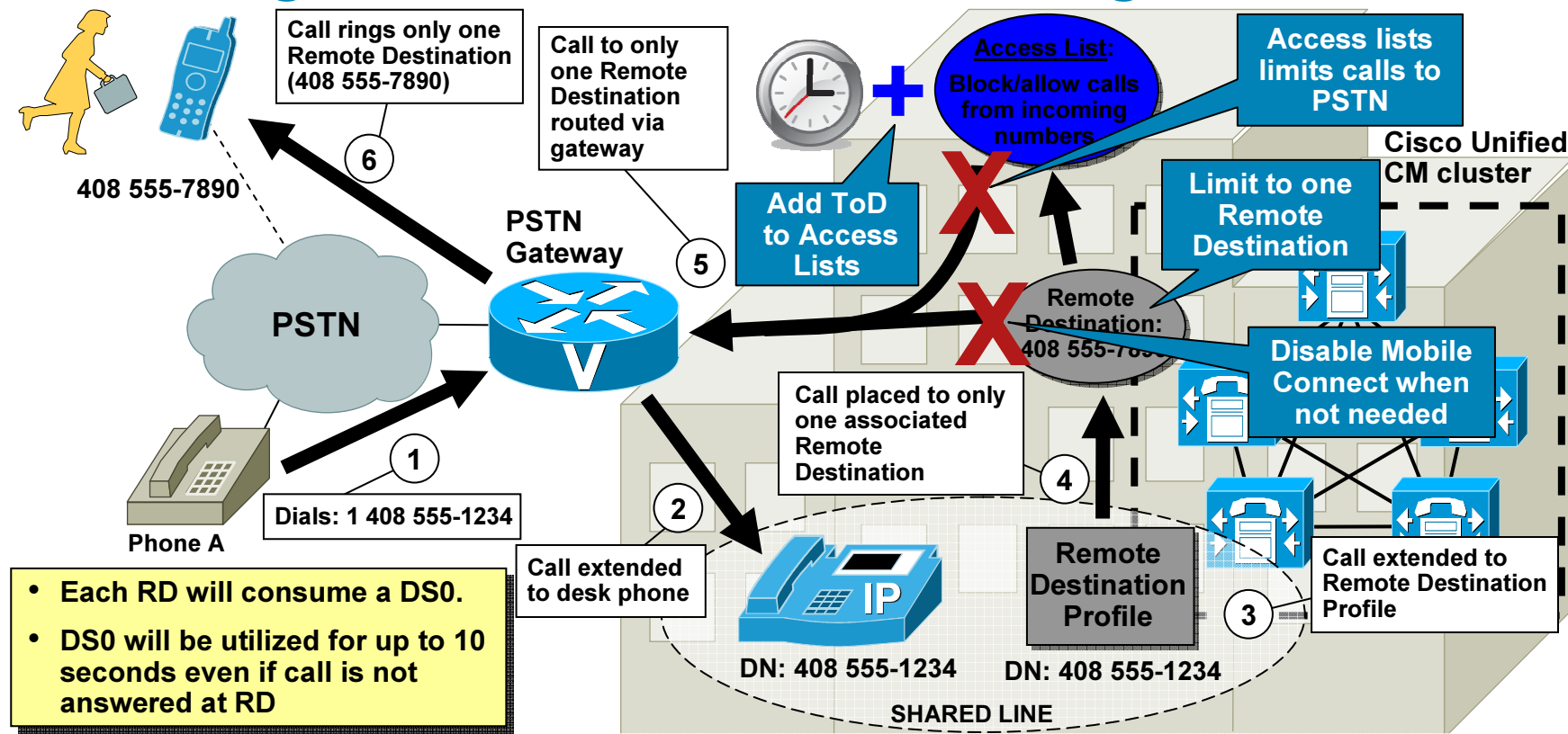
Design Considerations: Redundancy

- Redundancy for RD and RDP configuration provided via device pools/CM groups.
- Mobile Connect (including desk/remote phone pickup), Enterprise Feature Access (EFA), and Mid-Call feature functionality are all natively redundant
- Gateway and PSTN access redundancy as usual, however branch in SRST mode will have no or very restricted Unified Mobility functionality.
- No redundancy for Mobile Voice Access
 - If Publisher is down, MVA is not available
 - Enterprise Feature Access 2-Stage Dialing is still possible.
- If Publisher is down, changes to Mobile Connect status (on/off) via EFA are not saved (and therefore do not take affect).



UNITED MOBILITY

Design Considerations: Minimizing PSTN Utilization



PSTN resource utilization reduction for Unified Mobility

- Limit to one Remote Destination per user
- Utilize allow/block Access Lists to limit calls forwarded to PSTN
- Use time of day (ToD) Access Lists to limit calls forwarded to PSTN*

Unified Mobility

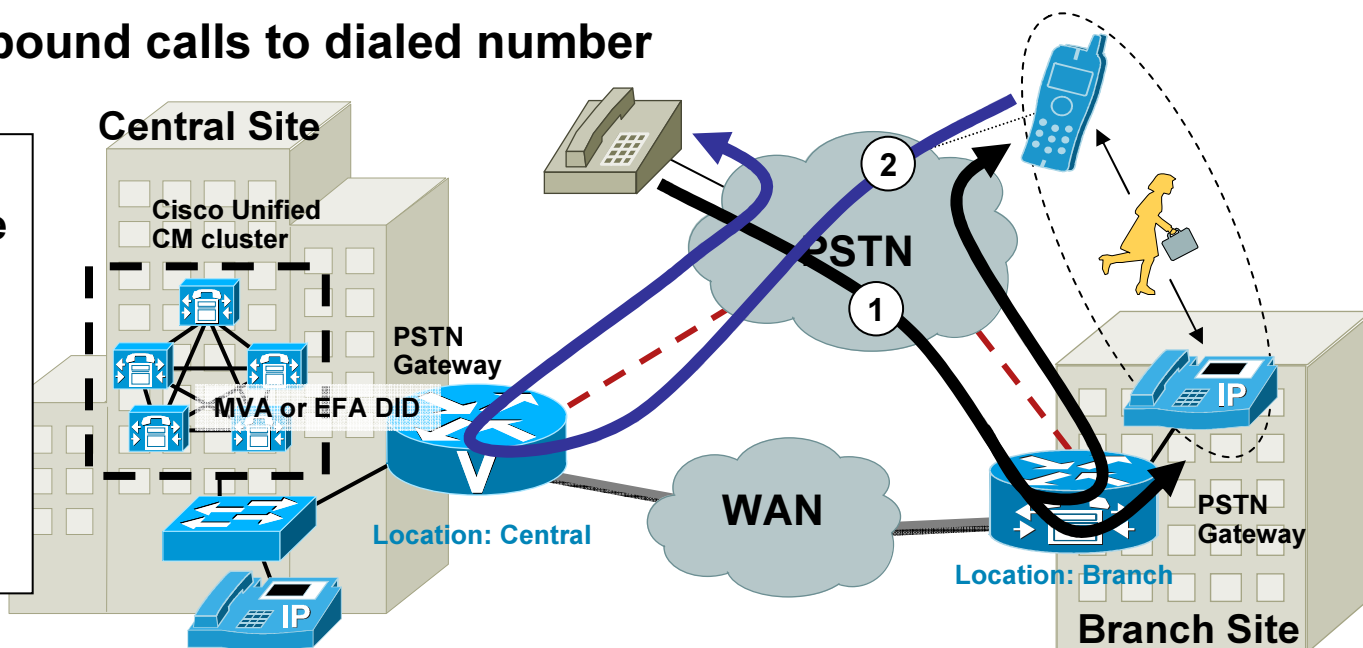
Design Considerations: Call Admission Control

To prevent location-based call admission control (CAC) issues, mobility **outbound calls** should be routed via the same gateway* that routed the initial inbound call:

- ① Mobile Connect outbound calls to remote destinations
- ② MVA or EFA outbound calls to dialed number

Potential CAC issues:

- Initial **CAC denial** due to insufficient bandwidth
- Subsequent desk phone pickup results in **WAN bandwidth oversubscription** (no CAC denial)



Company XYZ implications:

If any of the following are configured or will occur, **overprovisioning** of the WAN may be necessary:

- Site-based or TEHO call routing
- Extension mobility between locations

Unified Mobility

Design Considerations: Working with Service Provider

- **PSTN Connectivity**: Mobile Connect functionality is supported only with **PRI** for PSTN connections (no T1-CAS, FXO, FXS, or BRI connections)
- **DTMF Relay**: Mid-call features and Enterprise Feature Access 2-Stage Dialing require **out-of-band DTMF relay** between enterprise PSTN gateway and CUCM

Unified Mobility

Design Considerations: Working w./ Service Provider (cont.)

Caller ID: For Unified Mobility deployments, customer should work with their service provider to ensure the following:

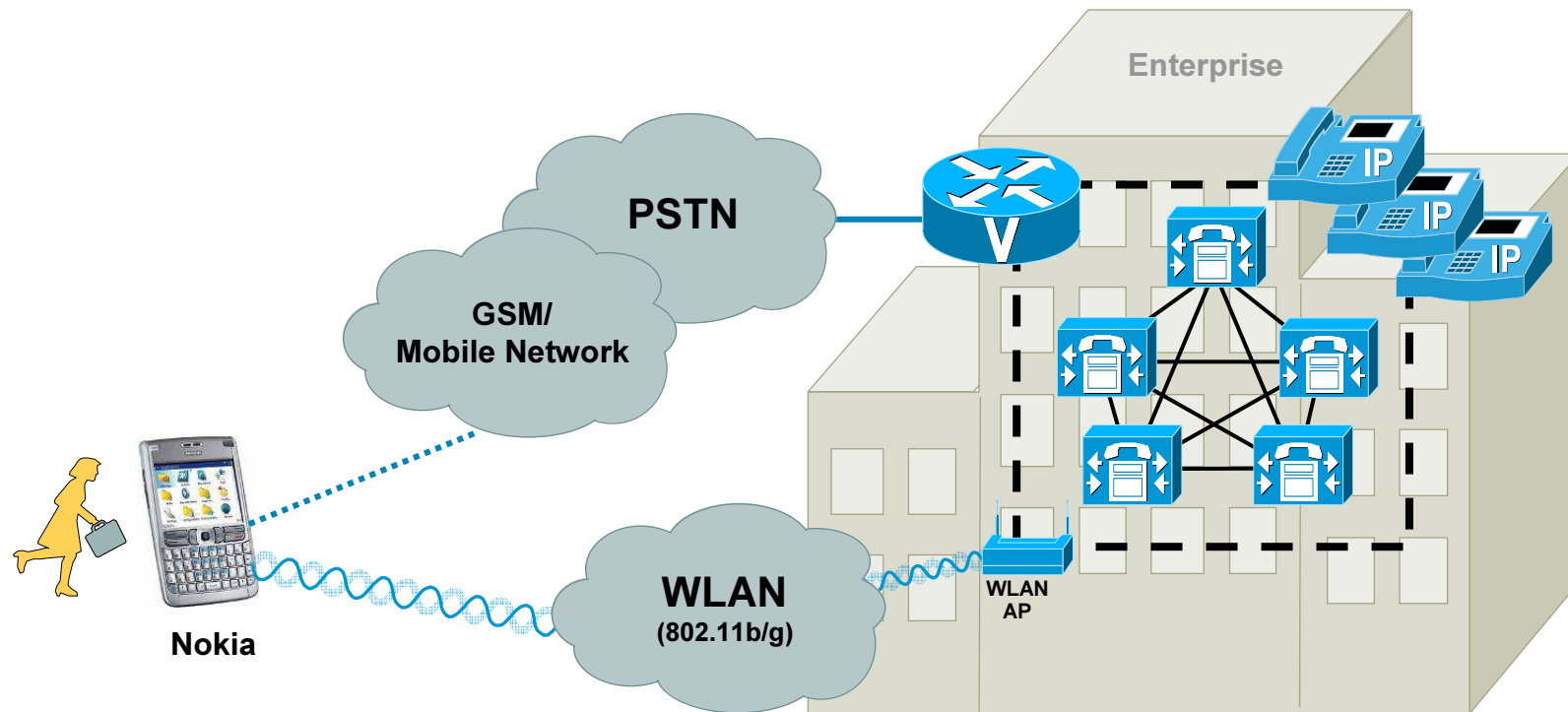
- Inbound Caller ID
 - ✓ If Enterprise Feature Access (mid-call features or 2-stage dialing) is required, service provider must send **appropriate inbound caller ID** to enterprise.
- Outbound Caller ID
 - ✓ If original caller ID for Mobile Connect calls is to be sent to mobility user's RD, service provider **must not restrict caller ID on trunk** to only DIDs assigned to that trunk.
 - ✓ If unable to provide unrestricted caller ID, then ensure **meaningful enterprise caller ID** is sent.

Deploying Dual-mode Phones



Dual-Mode Phones

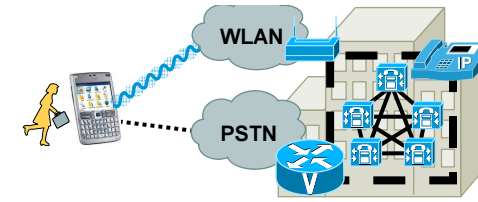
Nokia Call Connect: Architecture



- Dual-mode phones provide the ability to leverage enterprise IP telephony infrastructure (via WLAN connectivity) for making and receiving calls inside the enterprise.
- When outside the enterprise the dual-mode device falls back to the GSM/PSTN network

Dual-Mode Phones

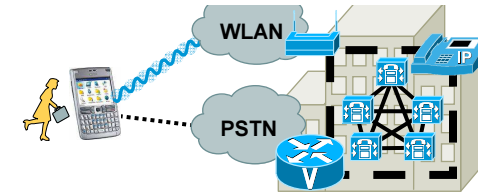
What Does It Include?



Nokia Call Connect dual-mode phone solution provide the following features and functionality:

- **SCCP client registration to CUCM**
- **WiFi: 802.11 b/g connectivity**
- **WLAN: Support for Cisco Compatible eXtensions (CCX) v. 3 or v. 4 (handset dependent)**
- **Access to enterprise hold, resume, transfer, conference, park**
- **Messaging waiting indication (MWI) for enterprise voicemail**
- **Manual handoff to cellular**
- **Mobile Connect/SNR (when integrated with Unified Mobility)**
- **Device Mobility** (CUCM feature supported with versions 4.2, 6.0 and later)

Dual-Mode Phones What Will It Cost?



Company XYZ will incur the following additional costs for deploying Nokia Call Connect dual-mode phones:

- **Nokia software user license (*NOK-SCCP-CCM-xx=*)**
- **Six (6) Device License Units (DLUs) per Nokia phone (Nokia S60 device type within CUCM).**
- **Additional four (4) DLUs per user for Unified Mobility integration (unless desk phone is also deployed)**
- **Nokia handset per user**

Dual-Mode Phones Handset Support



Nokia E51 *



Nokia E60



Nokia E61



Nokia E61i



Nokia E65



Nokia E66 *

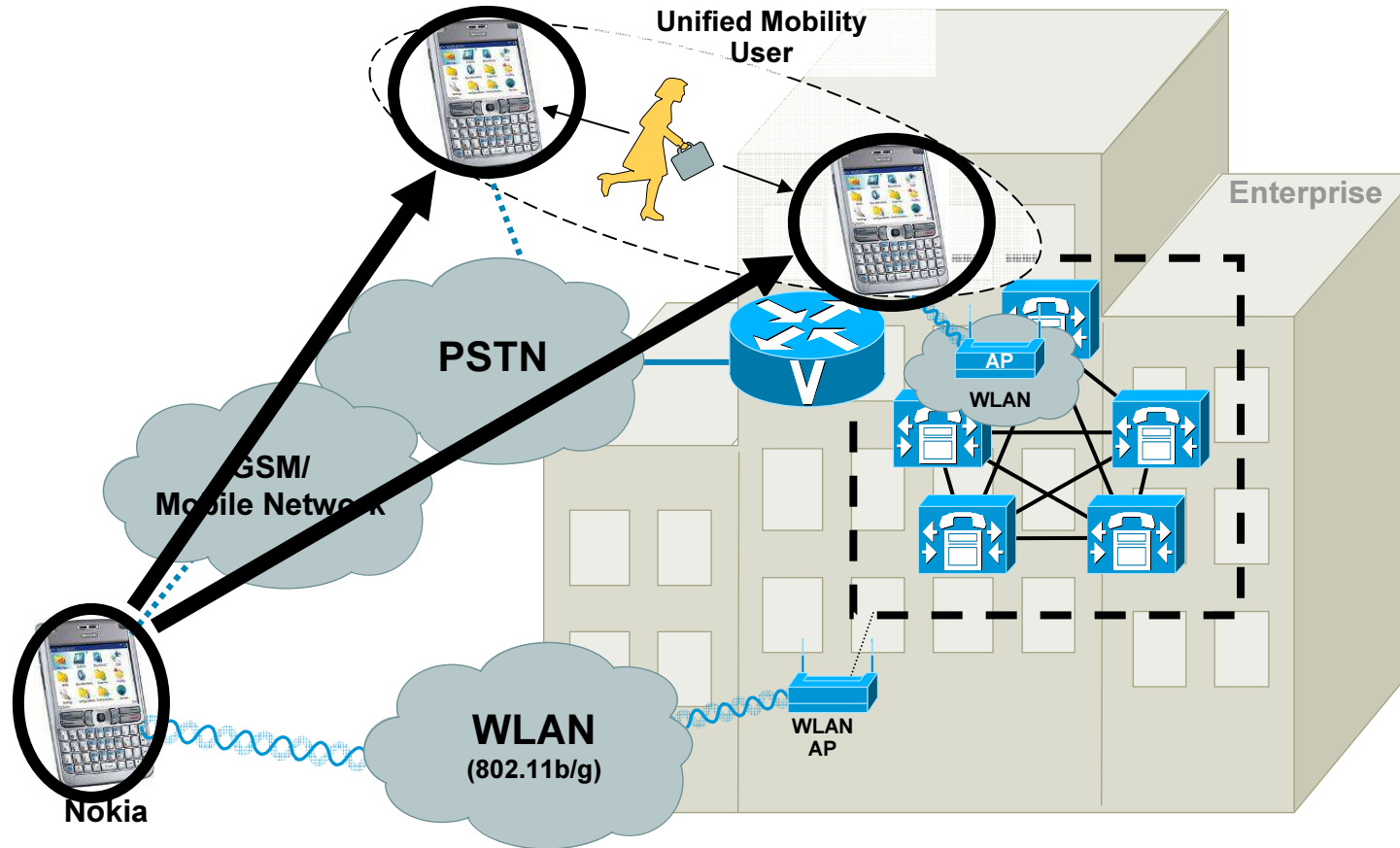


Nokia E71 *

- **E51, E66, and E71 only handsets to support:**
 - Switch to Cellular
- **E66 and E71 only handsets to support:**
 - CCX v. 4 (includes 802.11i, CAC, QoS)
 - EAP-FAST

Dual-Mode Phones

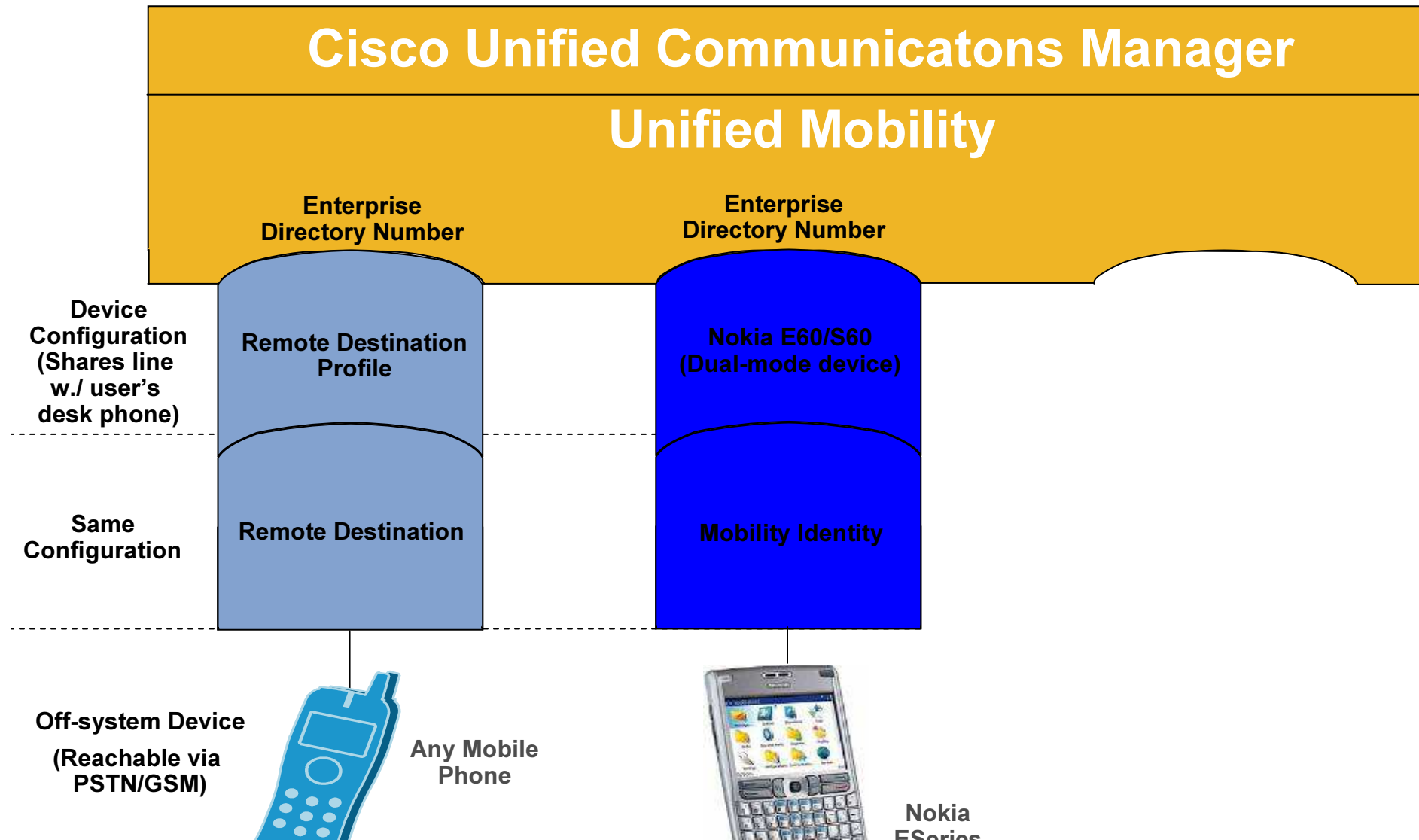
Unified Mobility Integration



- **WLAN client on Nokia dual-mode phone registers to CUCM as user's enterprise IP phone.**
- **GSM/PSTN number is defined as a Mobility Identity associated directly to Nokia device within CUCM**

Dual-Mode Phones

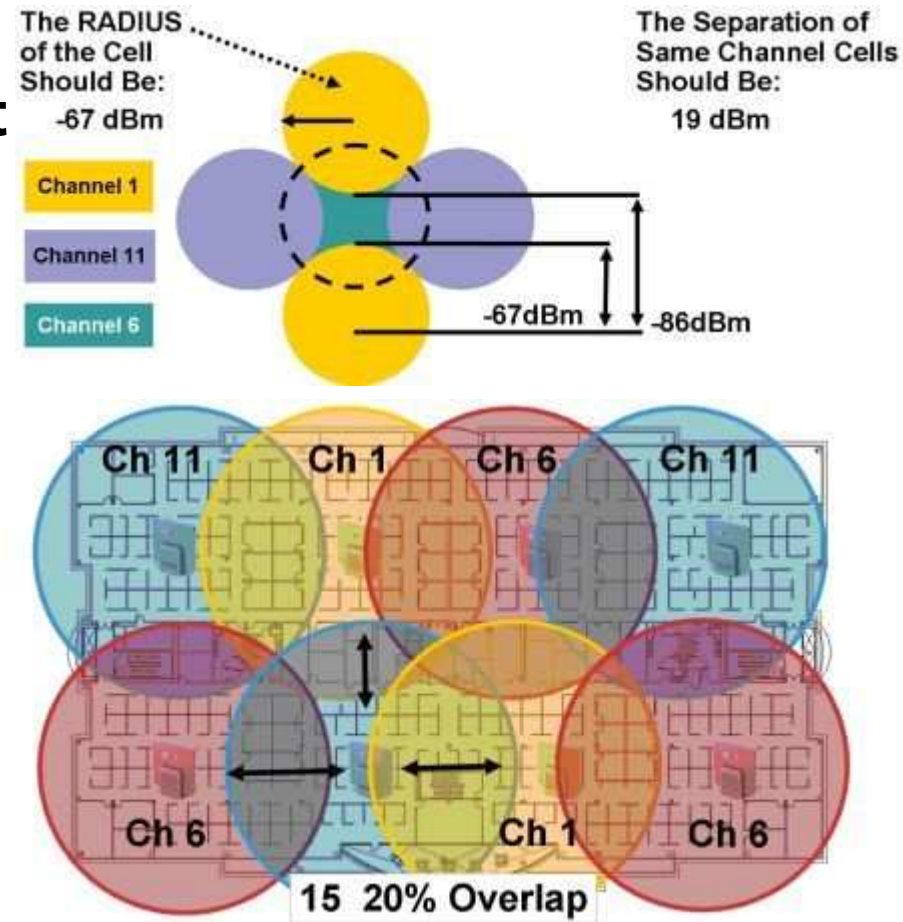
Unified Mobility Integration: Configuration



Dual-Mode Phones

Design Considerations: WLAN

- 802.11b/g
- CCX version 3 or 4 (handset dependent)
- No seamless handoff between cellular and WLAN networks
- QoS marking by client (signaling and media)
- Similar VoWLAN network design requirements as Cisco Unified Wireless IP Phone 7921G and 7925G

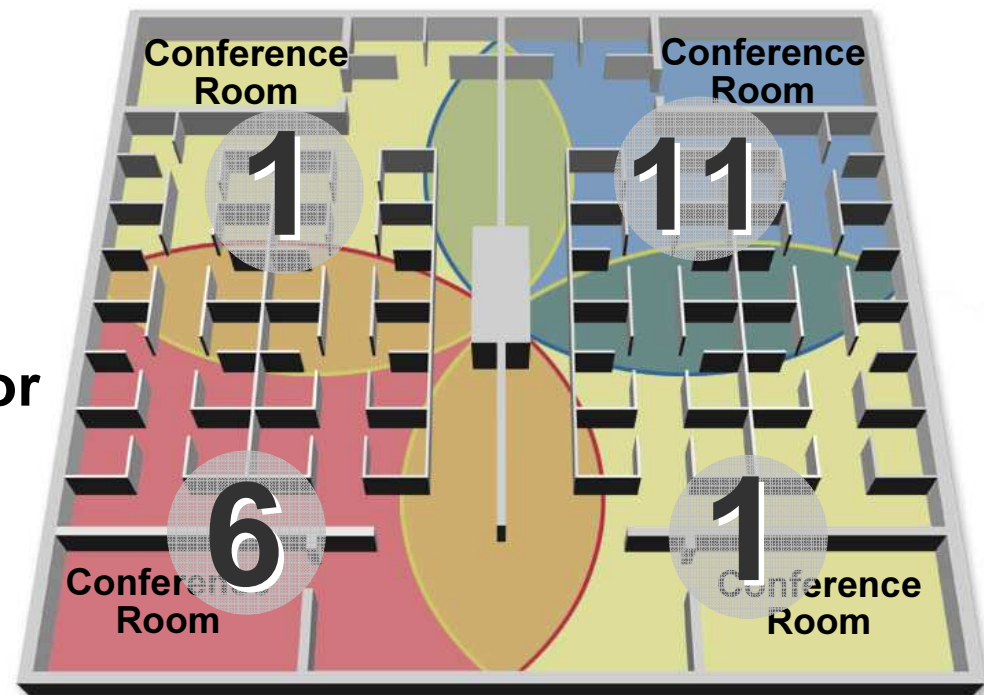


For more information on VoWLAN design see the *Voice over Wireless LAN 4.1 Design Guide* at:

Dual-Mode Phones

Design Considerations: Voice over WLAN

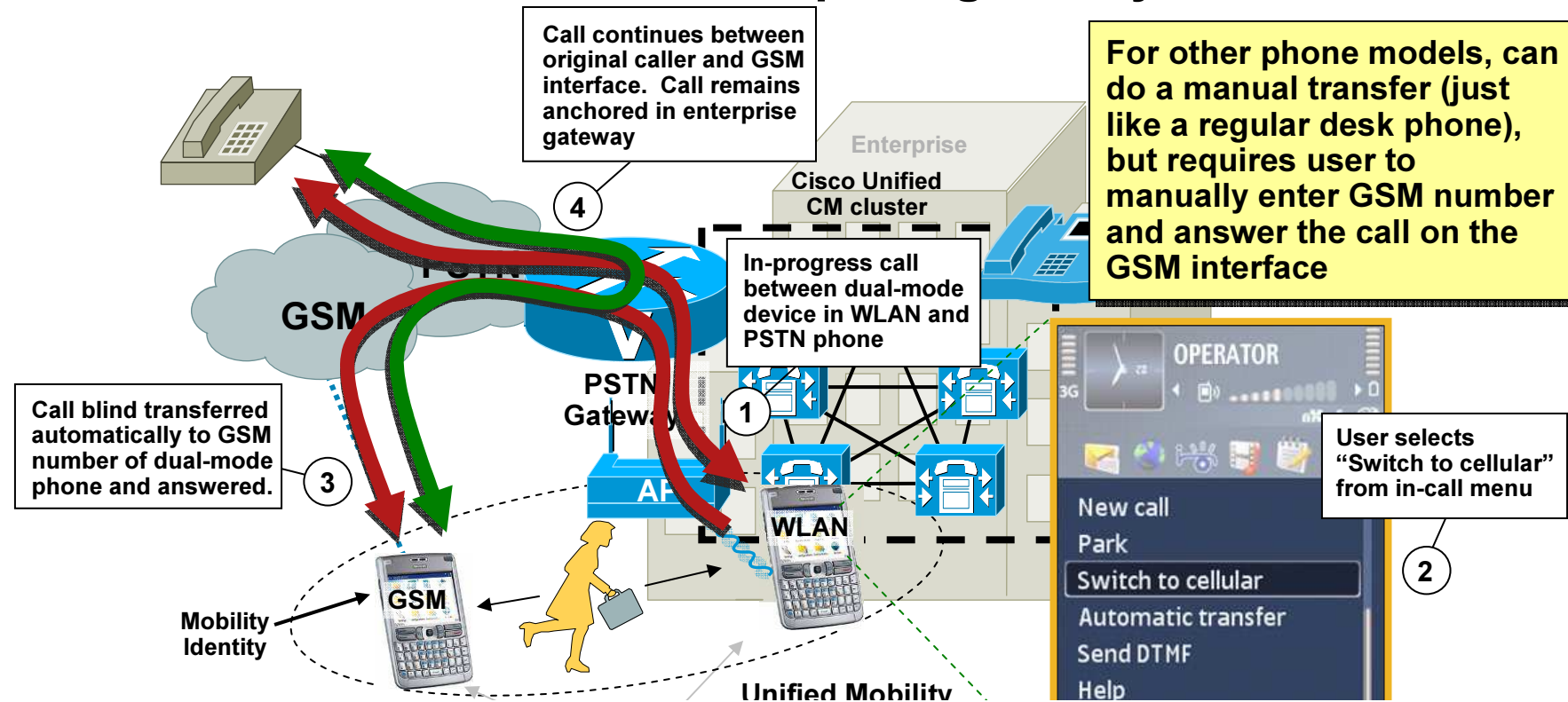
- WLAN Infrastructure must be deployed or already in place.
- Site-survey required prior to adding VoWLAN devices.
- Even if VoWLAN devices are already deployed, Nokia devices should be tested prior to complete rollout
- Bluetooth headsets are not recommended with Nokia handsets due to interference on the 2.4 GHz band.



Dual-Mode Phones

Design Considerations: Handoff (Switch to Cellular)

- Allows user to manually transfer active call from VoWLAN to pre-defined GSM number (Hand-out)
- Logic built into the client and only available only on the Nokia E51, E66, and E71 phone.
- Call remains anchored in enterprise gateway



Dual-Mode Phones

Design Considerations: Dial Plan

End-user Dialing Behavior: Dialing on the GSM/PSTN is different than dialing within the enterprise network.

1. User Effort: Users check for CUCM registration icon.



- If present, user dials using enterprise dial plan (abbreviated dialing, PSTN steering digits, etc.)
- If not present, user dials using PSTN dialing method (+ and/or E.164)

Recommended

2. Admin Effort: CUCM dial plan configured to accommodate PSTN/GSM dialing.

- User always dials all calls using '+' or full E.164 number (manually or from contacts)
- CUCM dial plan routes to local extensions as appropriate and/or prefixes appropriate PSTN steering digits.

Deploying Unified Mobile Communicator



Unified Mobile Communicator

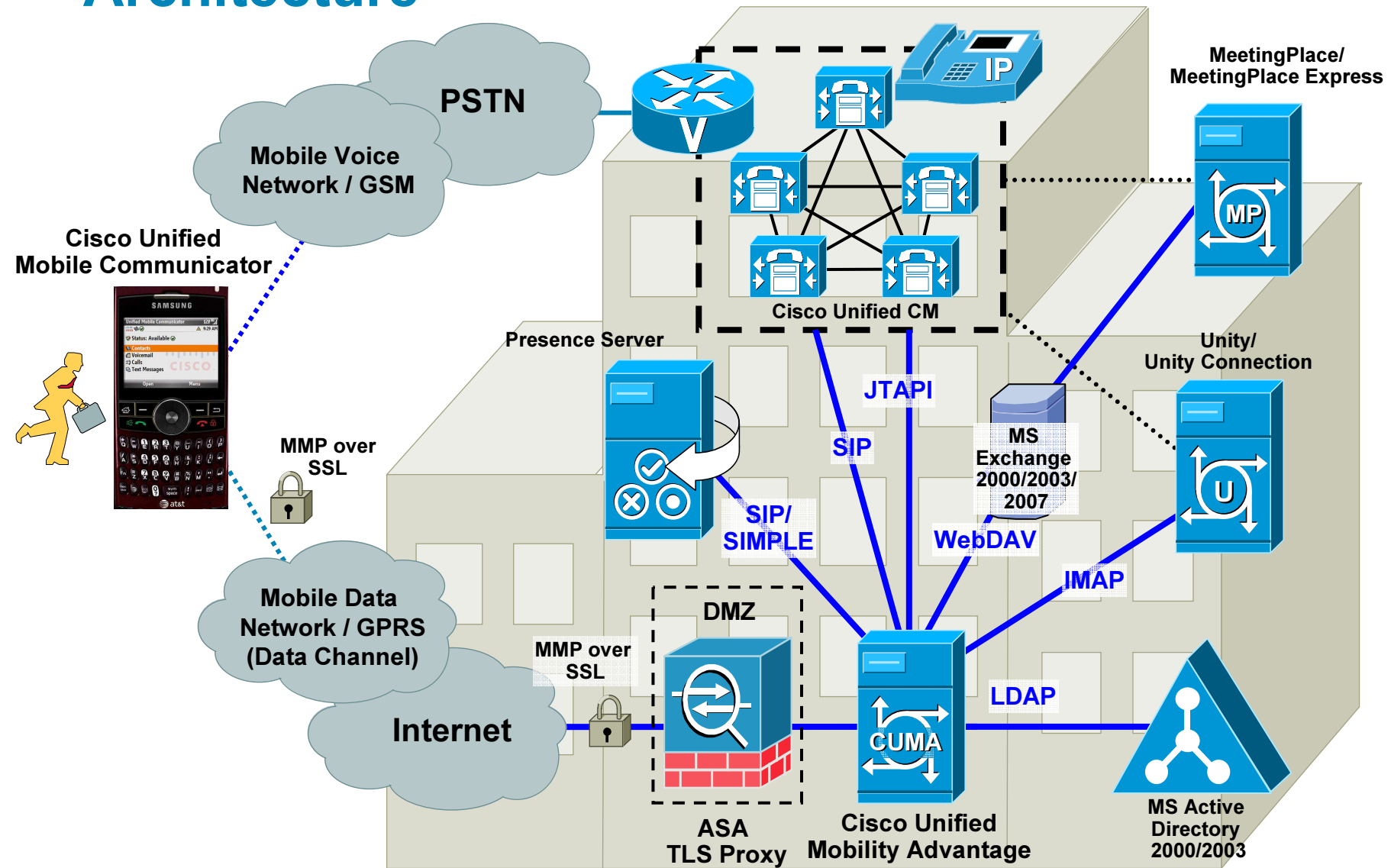
What Does It Include?

CUMC provides the following features and functionality from the user's mobile device:

- Enterprise directory lookups
- Secure text messaging between CUMC clients
- Presence
- Enterprise visual voicemail and MWI
- Conference notifications and click-to-call
- Desk phone call log integration
- Mobile Connect/SNR (when integrated with Unified Mobility)
- Dial via office*
- Mobile Connect client toggle*

*** New with CUMC 7.0**

Unified Mobile Communicator Architecture



Unified Mobile Communicator

What Will It Cost?

Company XYZ will incur the following additional costs for enabling CUMC:

- CUCM {
- One (1) Device License Units (DLUs) per user for Cisco Unified Mobile Communicator device.*
 - Two (2) or four (4) DLUs per mobility-enabled user with or without an associated desk phone.
 - One (1) Cisco Unified Mobility Advantage (CUMA) server client access license per user.
 - ASA mobility proxy functionality.
 - Minimum of one (1) signed SSL certificate from Certificate Authority
 - Hardware:
 - MCS-7845 H2/I2 or MCS-7825 H3/I3 (CUMA server)
 - Cisco ASA 55xx
 - Blackberry Enterprise Server (BES) if deploying BB clients
 - Microsoft Exchange and Microsoft Active Directory servers

UNITED Mobile Communicator Handset Support

Handsets currently supported with CUMC 3.X



RIM OS

					
8100 (Pearl)	8300 (Curve)	8700	8800	8820	8830

NOTE:
Service Provider support for CUMC 3.x handsets is required and varies depending on geographic location

NOKIA

Symbian OS

		
E61	E61i	E65

- All CUMC versions 3.x or 7.x are supported with CUMA 7.0 server.
- CUMC 7.x client is required for **Dial-via-office** and **Mobile Connect toggle** functionality.

Handsets currently supported with CUMC 7.X

**Windows
Mobile 6.0/6.1
Standard**

	
Samsung Blackjack II	Motorola Q9H

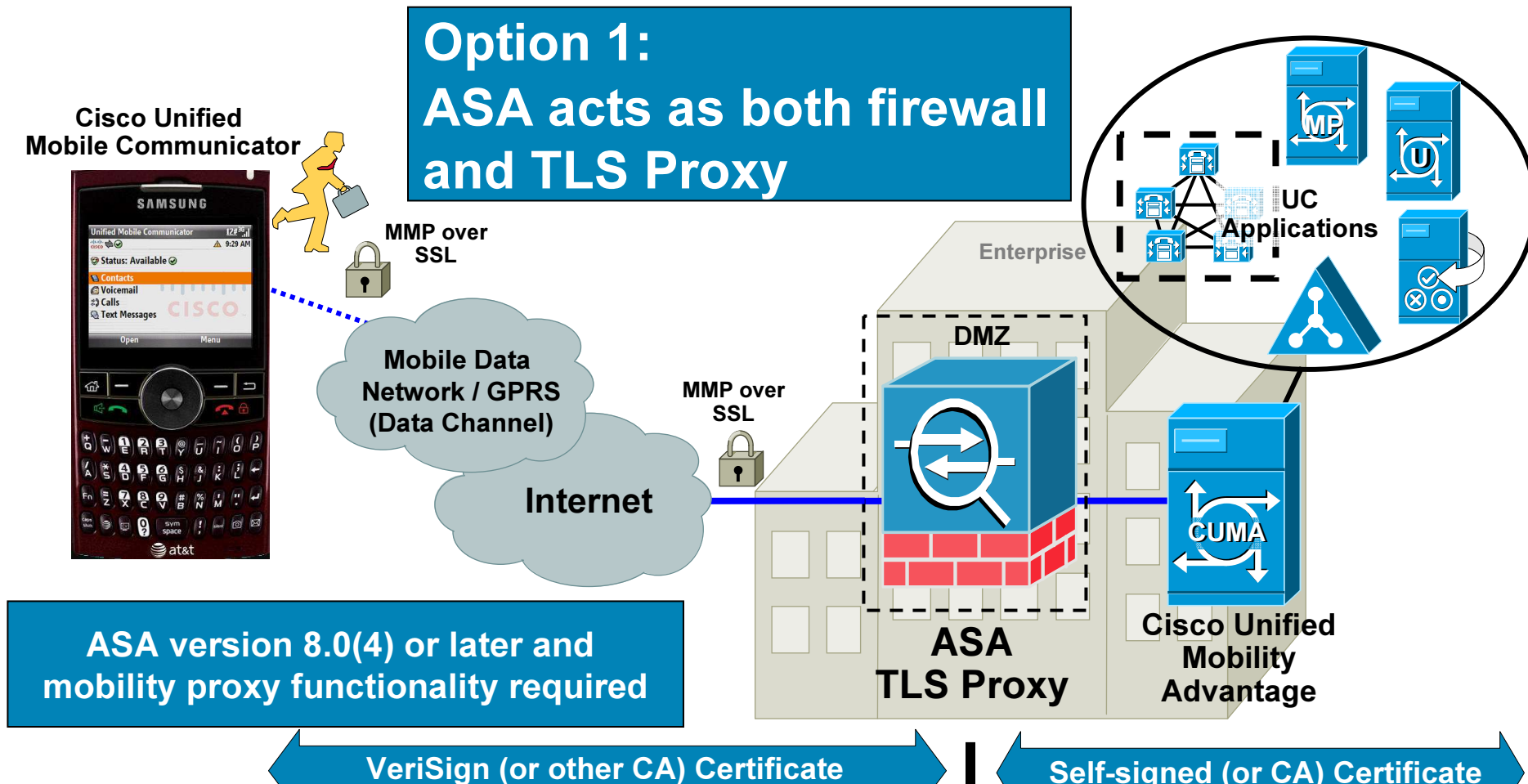
Other Windows Mobile 6.0/6.1 Standard devices that meet the following criteria are also supported:

- Installed VeriSign (or GeoTrust) root certificate
- No restriction on running 3rd party applications
- PDA-style form factor (full QWERTY keyboard and screen size of 320X240 pixels)
- Full internet access data plan from service provider (no email-only plans)

Unified Mobile Communicator

ASA Deployment: ASA TLS Proxy and Firewall

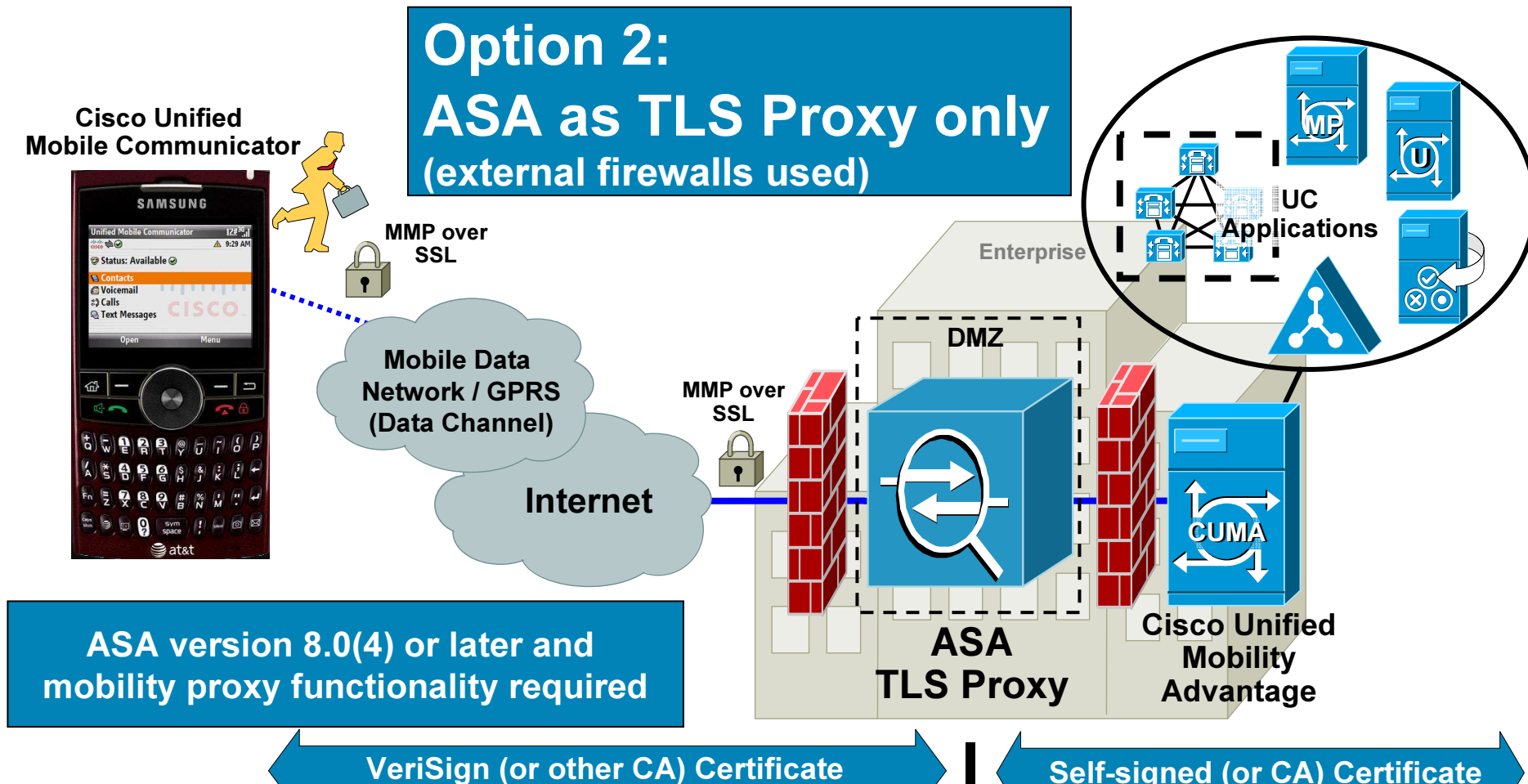
The Cisco Adaptive Security Appliance (ASA) can be deployed in one of two ways.



Unified Mobile Communicator

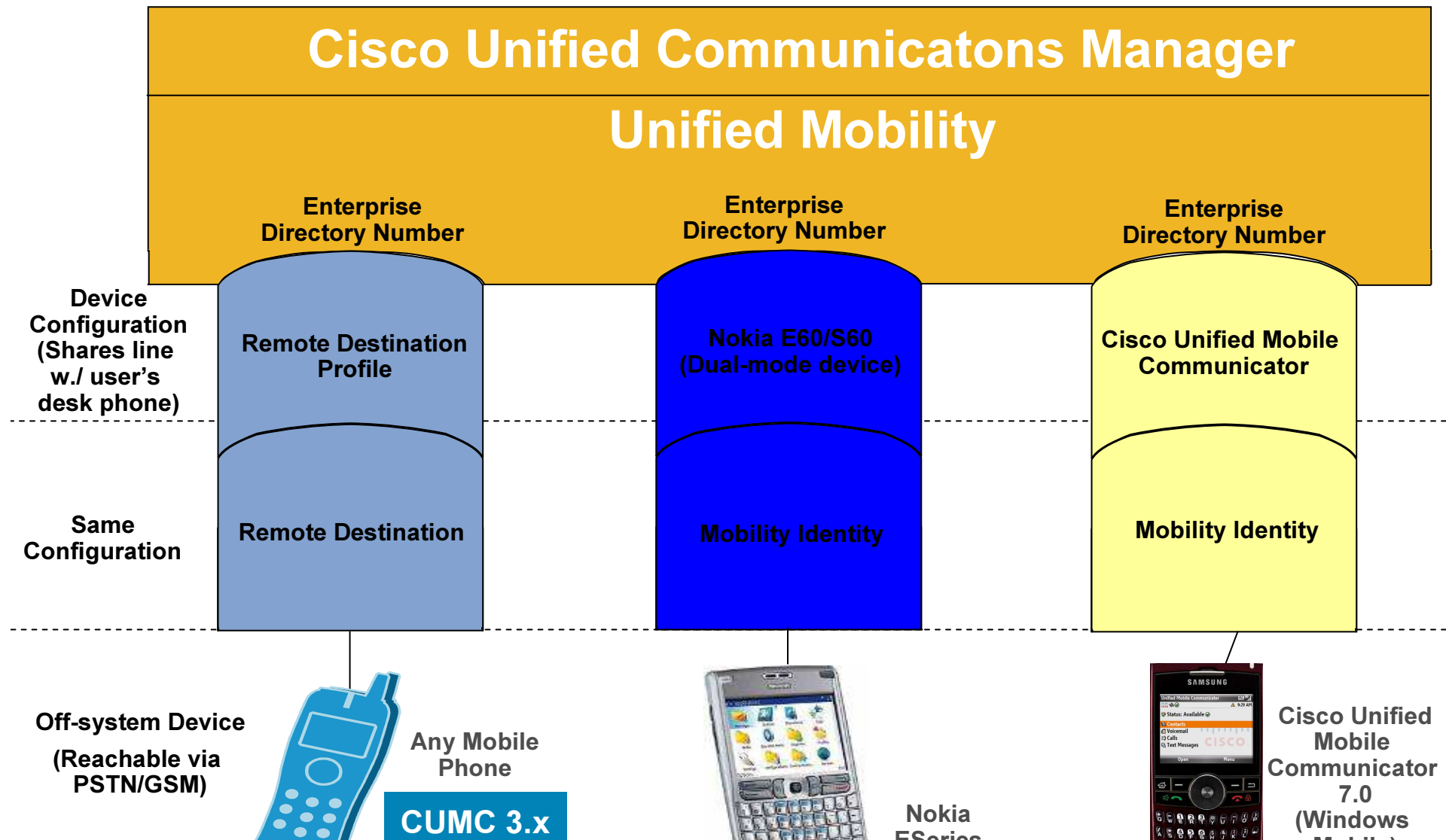
ASA Deployment: ASA TLS Proxy only

The Cisco Adaptive Security Appliance (ASA) can be deployed in one of two ways.



Unified Mobile Communicator

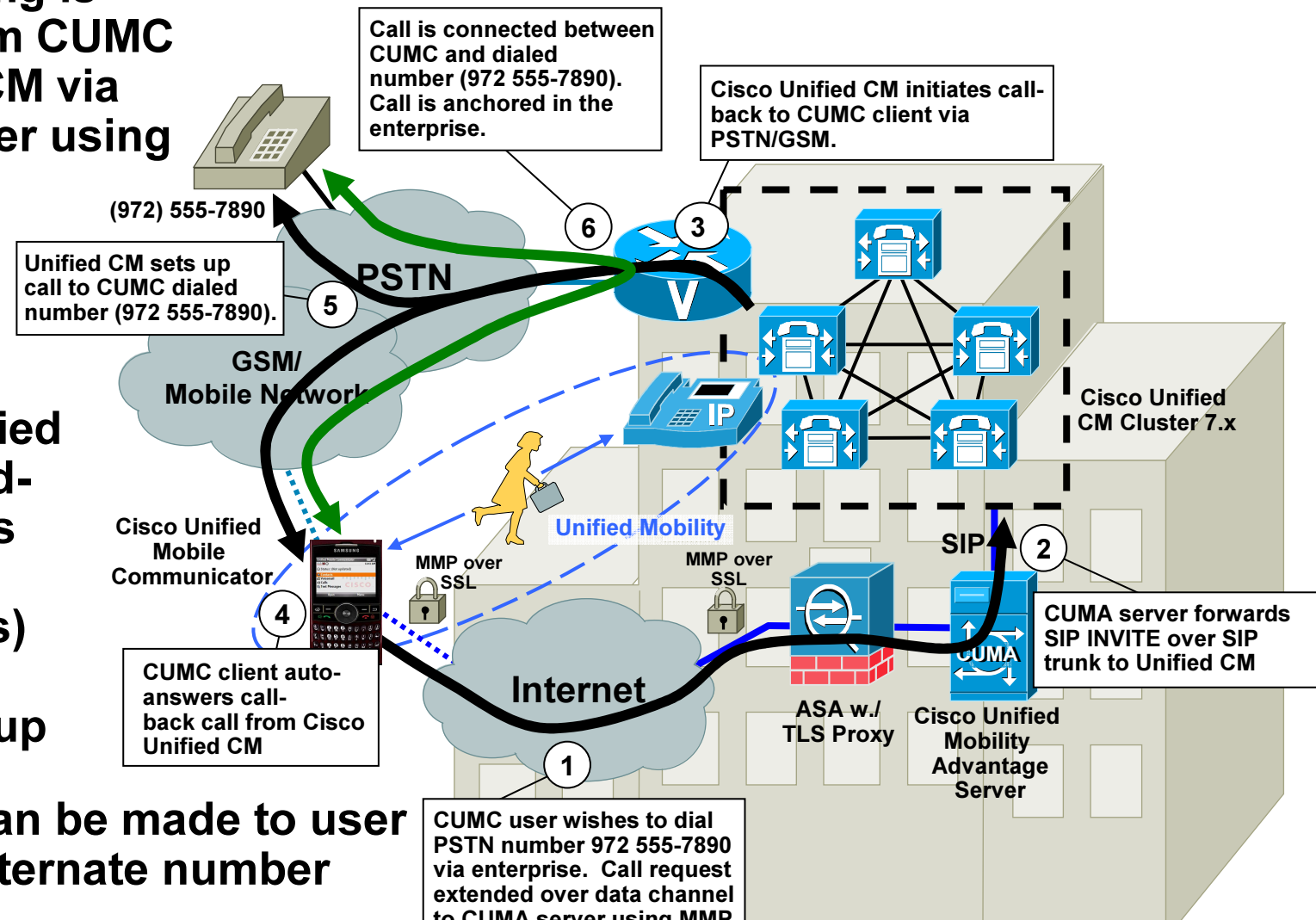
Unified Mobility Integration: Configuration



Unified Mobile Communicator

Dial via Office: Call Flow

- Call signaling is relayed from CUMC to Unified CM via CUMA server using SIP trunk
- With call anchored, user can invoke Unified Mobility mid-call features (via manual key presses) and desk phone pickup
- Call-back can be made to user specified alternate number

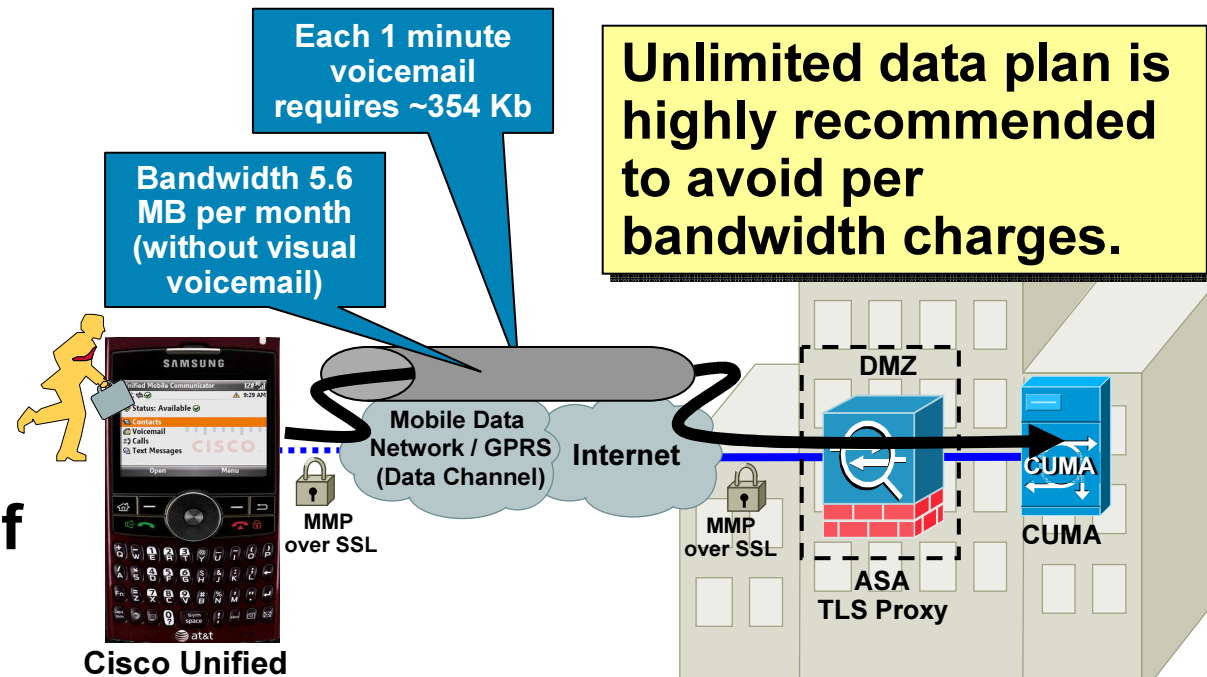


Unified Mobile Communicator

Design Considerations: Data Plan

For Cisco Unified Mobile Communicator deployments the assumption is that each user will have unlimited data plan:

- ~ 5.6 **MBytes** per month is considered a reasonable per user average if visual voicemail is not in use.
- Visual voicemail will consume considerably more bandwidth.
- Visual voicemail: A one (1) minute voicemail message will consume approximately **354 Kbits** worth of bandwidth.



Unified Mobile Communicator

Design Considerations: Roaming and Data Connection

Roaming across country boundaries with CUMC clients can present challenges for data connectivity.

- Typically moving across country boundaries results in roaming data charges even for unlimited data plans.
- Three ways to handle:
 - Pay data roaming charges. (\$)
 - Provision multiple handsets for CUMC within CUMA and CUCM. (\$)
 - Swap SIM cards in provisioned handset and manually update CUCM Mobility Identity number (via CUCM user pages) and CUMC alternate call back number (on mobile device). (User experience)



Unified Mobile Communicator

Design Considerations: Redundancy

Given a failure of CUMA or ASA or loss of mobile data network:

- Data connection from CUMC client to the enterprise becomes unavailable
- Mobile device will continue to operate but without access to enterprise applications (*No Dial via Office, visual voicemail, conference notifications, directory access, messaging, or presence*).
- All calls will be dialed direct (even when DVO is forced)
- If Unified CM (or CUCM to CUMA connection) fails, DVO is not possible. CUMC client receives message and may complete the call via direct dial.



Unified Mobile Communicator

Design Considerations: CUMA/CUCM Scalability

CUMC deployments scale in the following way:

- Up to **1,000** CUMC clients per CUMA server with **MCS-7845-H2/I2**
- Up to **250** CUMC clients per CUMA server with **MCS-7825-H3/I3**
(Require CUMA 7.0(2) MR)
- Only one Unified Mobility Advantage server per Unified CM cluster
- For desk phone call log integration within a deployment:
 - Up to 4 **application users** are configured within Unified CM with a max of 250 associated user desk phones.

CAUTION: Each associated user desk phone will consume a CTI connection. The number of CTI connections utilized for CUMC must be considered with regard to overall cluster CTI limits (800 per node/3,200 per cluster with MCS-7835)

Unified Mobile Communicator

Design Considerations: ASA Scalability

ASA Platform	Installed DRAM	Max. UC/ Mobility Proxy Function Limit	Max. Number of Mobile Communicator Clients
ASA 5505	256 MB	24	24
ASA 5510	256 MB	100	100
ASA 5520	512 MB	1,000	1,000
ASA 5540	1024 MB	2,000	2,000
ASA 5550	4096 MB	3,000	3,000

- If ASA is used for other UC applications (e.g. Phone Proxy), number of supported Mobile Communicator clients may be less

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