
TOMORROW
starts here.
CISCO
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Design and Deployment of Unified Contact Centre Enterprise (UCCE)

BRKCCT-2662

Michael Oldham – Network Consulting Engineer

#clmel

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Session

- Covers the fundamentals of designing and deploying a Cisco Unified Contact Centre Enterprise solution.
- Look at **design and deployment best practices**.
- Will use the **requirements specification of a large contact centre** to highlight the design process.
- Topics include
  - Choosing a deployment model
  - Planning for high availability
  - Sizing systems
  - Estimating bandwidth for the Contact Centre.
- This is an **intermediate to advanced** level session intended for network planners, design engineers, administrators and technical staff.

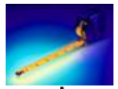
Agenda

- Life Cycle
- Kick Off
- Requirements
- Design
- Testing
- Monitoring

Life Cycle

PDIOO

- Customer Requirements
- Cisco Hardware and 3rd Party SW Quote
- Prelim. Network Design
- Project Plan
- Project Kickoff
- Sign off



- Design Workshop
- Site Survey
- High Level design
- Detailed Design Specification
- Application Detailed Design Specification
- HW and SW Orders
- Implementation Plan
- Test Plan
- Sign off

- Site Preparation
- Network Installation
- Unified Contact Center Installation
- Implementation Testing
- Sign off

- Support Handoff
- Project Close
- Day 2 Support
- TAC Handoff

- Audit
- Scripting
- Design

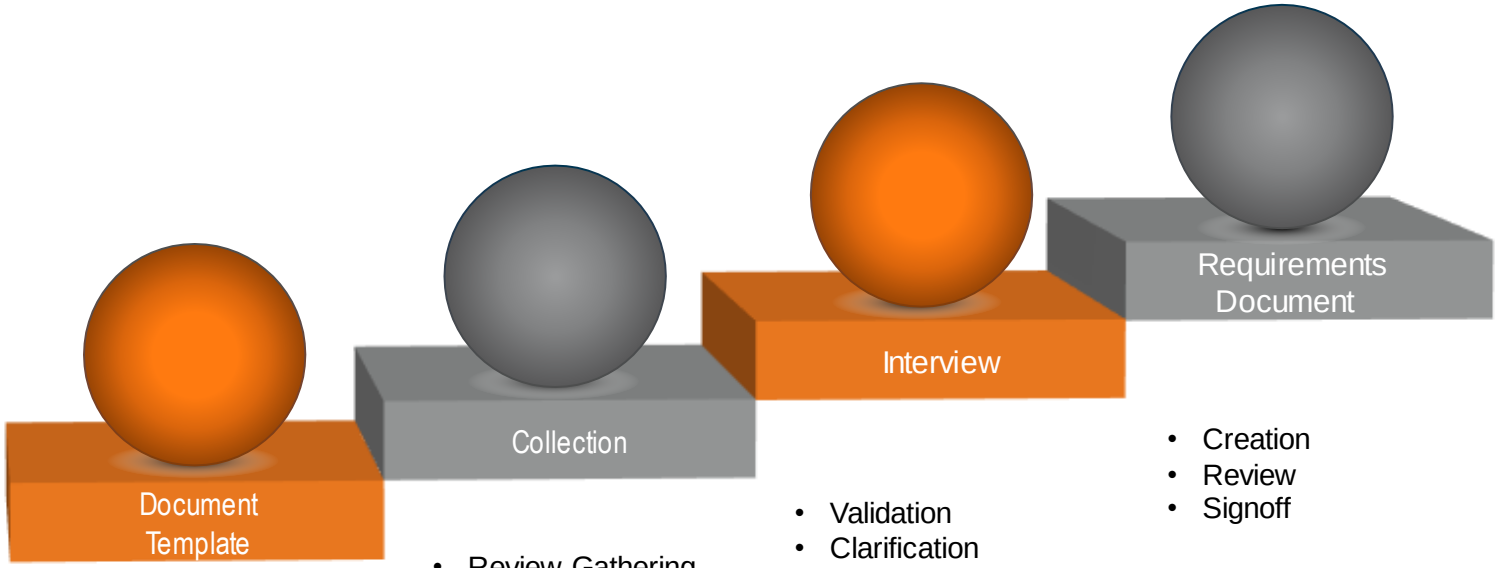

Kick off

Kick Off

- Introduce the Cisco and Customer team
- Define the structure of the team
- Discuss the approach using a high level project plan
- Bill Of Materials
- Review Deliverables and their format/language
- Statement of work
- Any designs/RFP responses
- High level timelines and milestones
- Discuss processes such as weekly update's, review cycles, escalation, change control.

Requirements

Requirements Process



- Unified Communications
- Customer Business Unit
- Infrastructure
- Call Flows

- Review Gathering document
- Customer sends to owning departments
- Give 3 weeks
- As IS

- Validation
- Clarification

- Creation
- Review
- Signoff

ACME Requirements - Who will be interviewed?

Business

IT Groups

Contact Centre Staff

ACME Requirements - Business Needs

Sponsor

Project Manager

Strategy Group

Purchasing

- Success Criteria
- Customer and Products
- Timelines
- Growth
- Organisation Structure
- Project Methodology
- Day2 support

ACME Requirements - Contact Centre Needs

Supervisor

Agents

Reporting

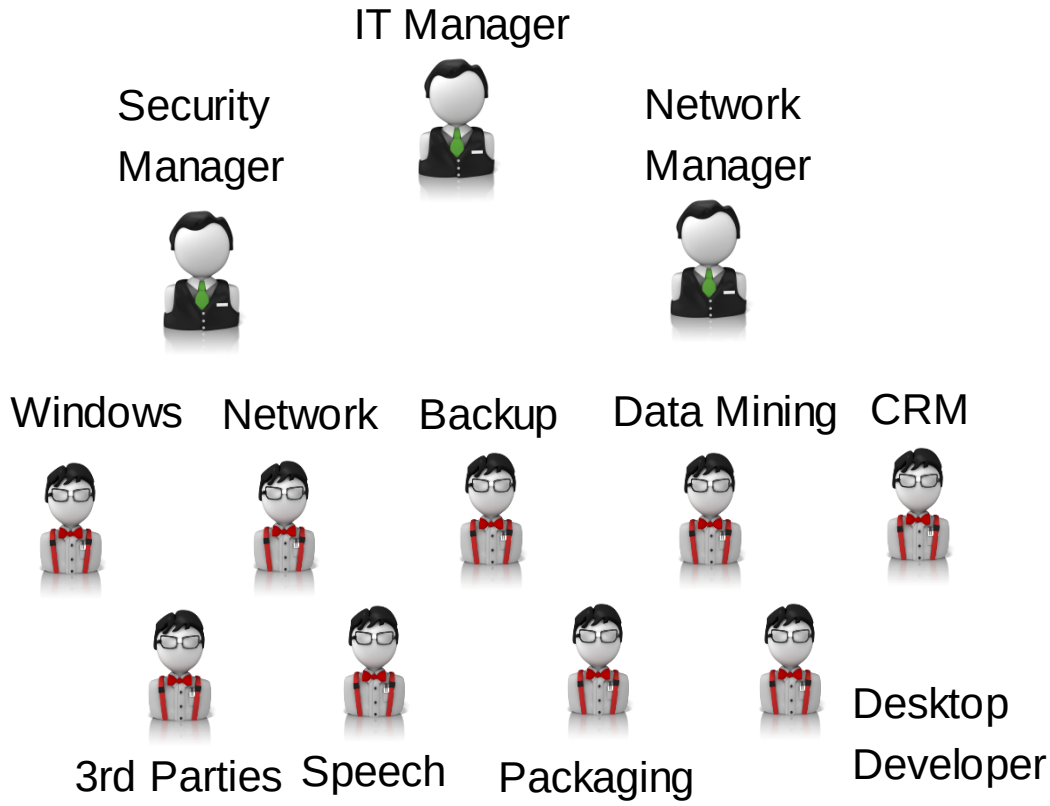
WFM

Recording

Outbound

- SLA, Barge-in, Monitor
- Wrapup, Reason / Not ready codes
- Full recording, On demand, tags
- Statistics, Real time, Historical
- Call Flow Menu Tree
- Languages
- Business Hours, Holiday, Breaks
- Sites, Timezones
- Outbound Campaign strategy

ACME Requirements - Information Technology Needs



- Security policy (DMZ,firewalls, Virus, Encryption)
- Conferencing, Transfers
- Dial Plan, External numbers
- Bandwidth, QOS
- Desktop and OS
- Front End, Backend systems
- Backup Policy
- Existing Legacy Systems
- AD level

ACME Requirements - Sizing for ACME

Is this a small/ medium/large centre?

50 ms Latency to site

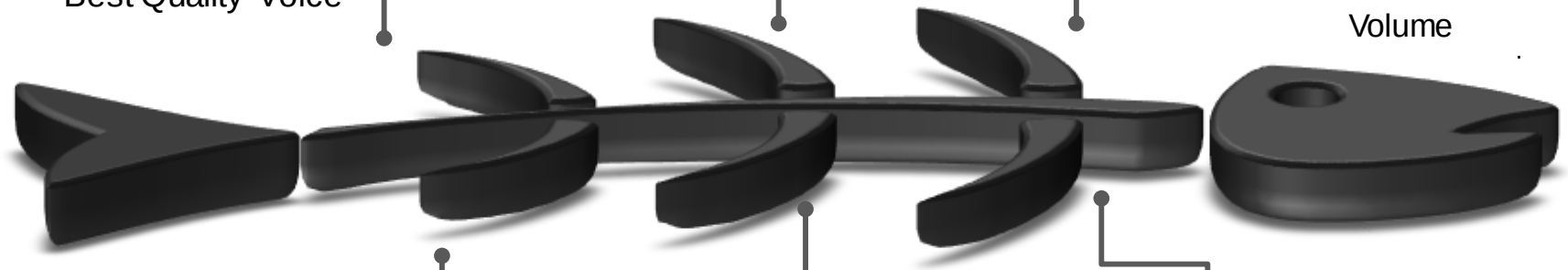
30 sites all within a 3000 km range

Best Quality Voice

100 conferences
11,000 agents
14,000 agent growth

240,000 BHCC
67 cps

Volume

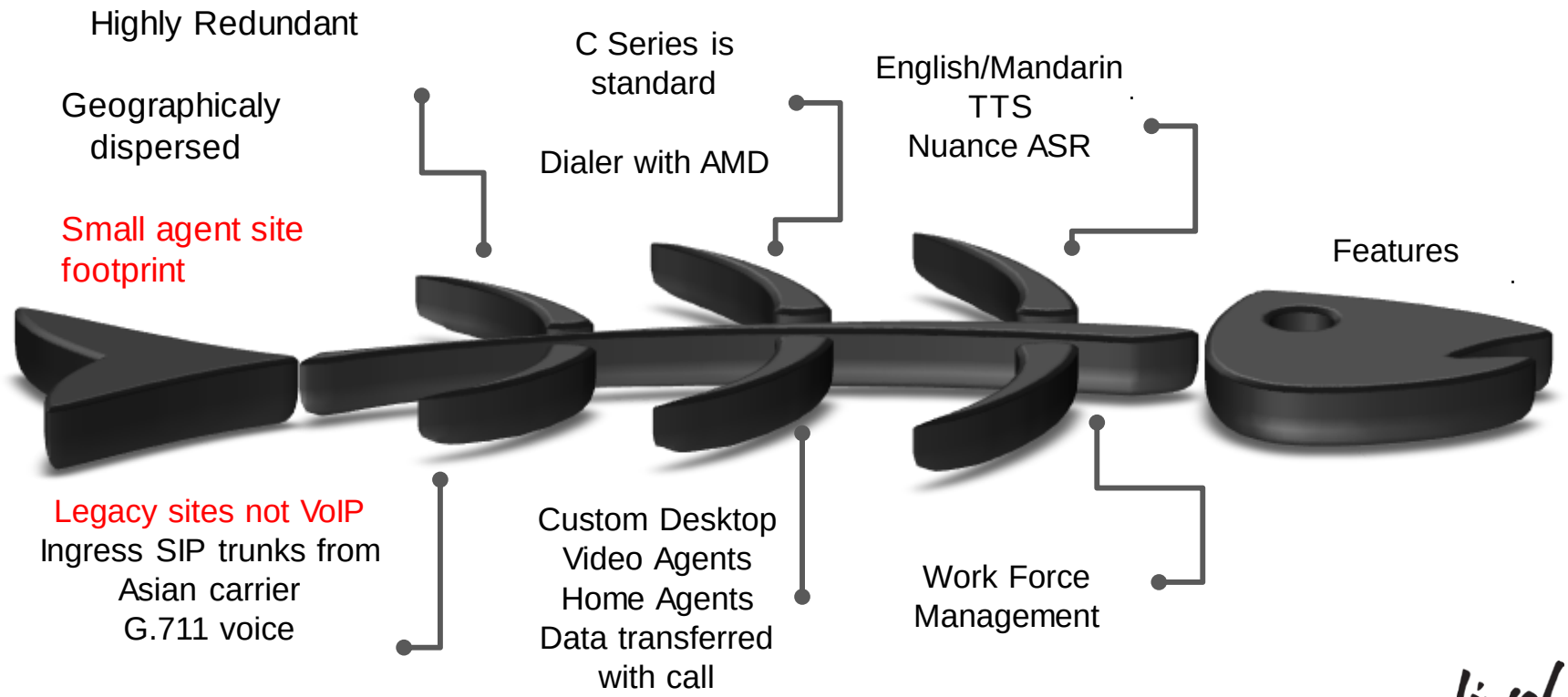


180 AHT
30 s treatment
60 s wrapup

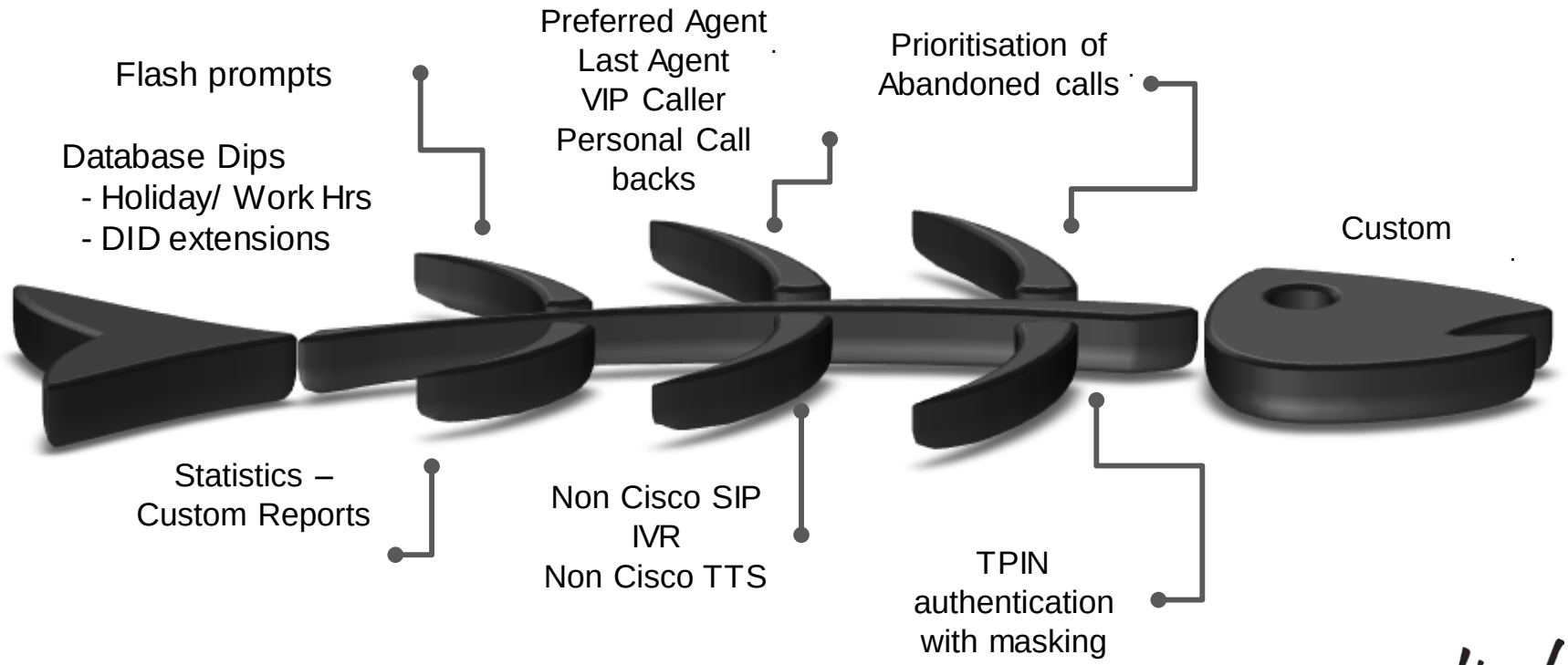
35 % self service
80% in 20s SLA
5 skill groups per Agent

Five 3rd parties
Outbound Dialer
Nine CRM systems

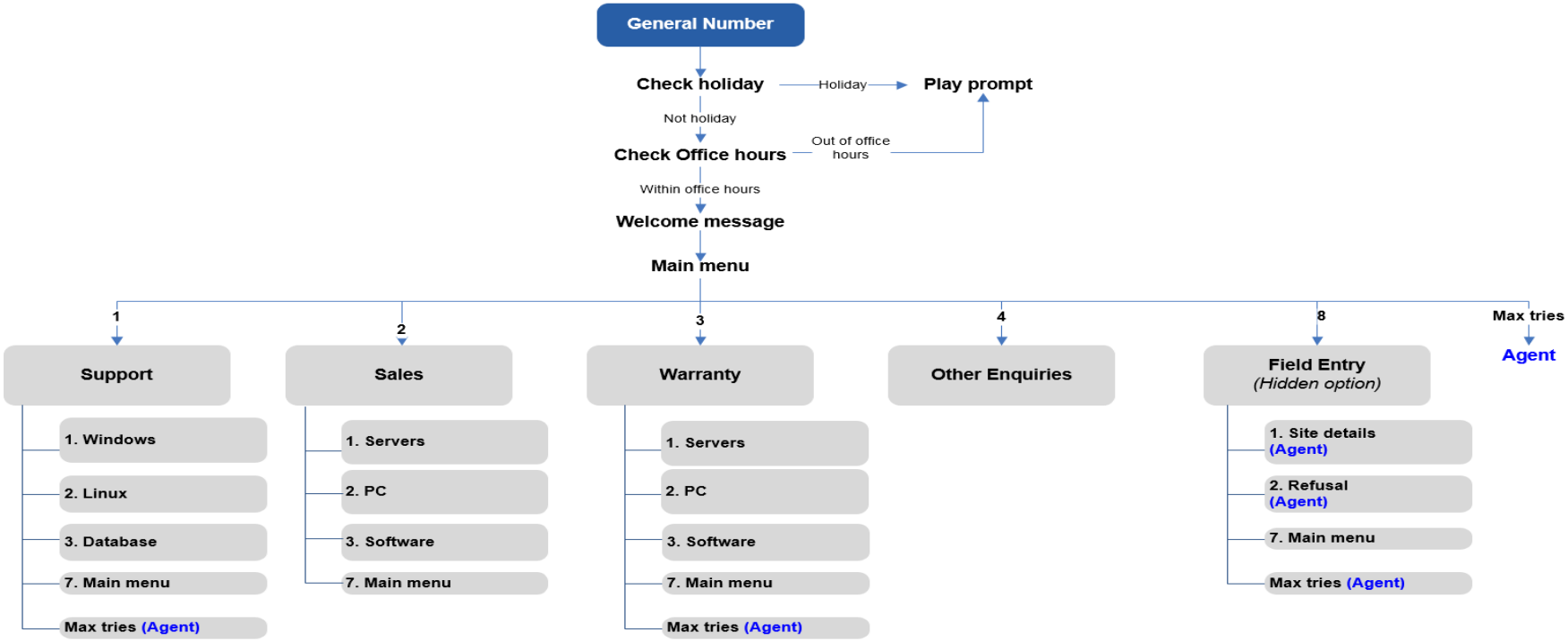
ACME Requirements - Infrastructure Features



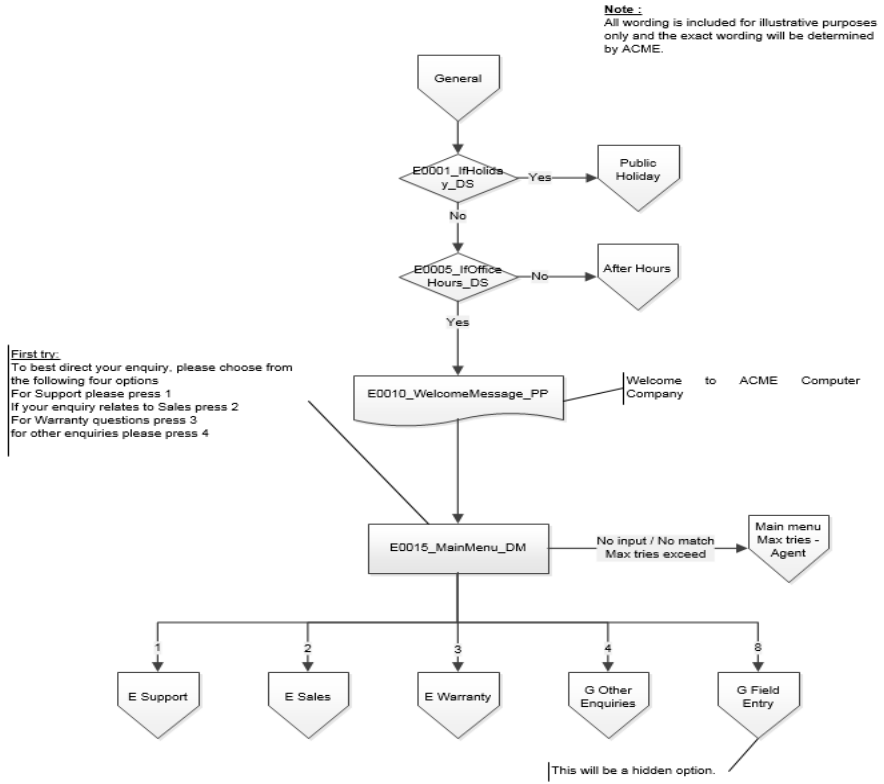
ACME Requirements - Customisation



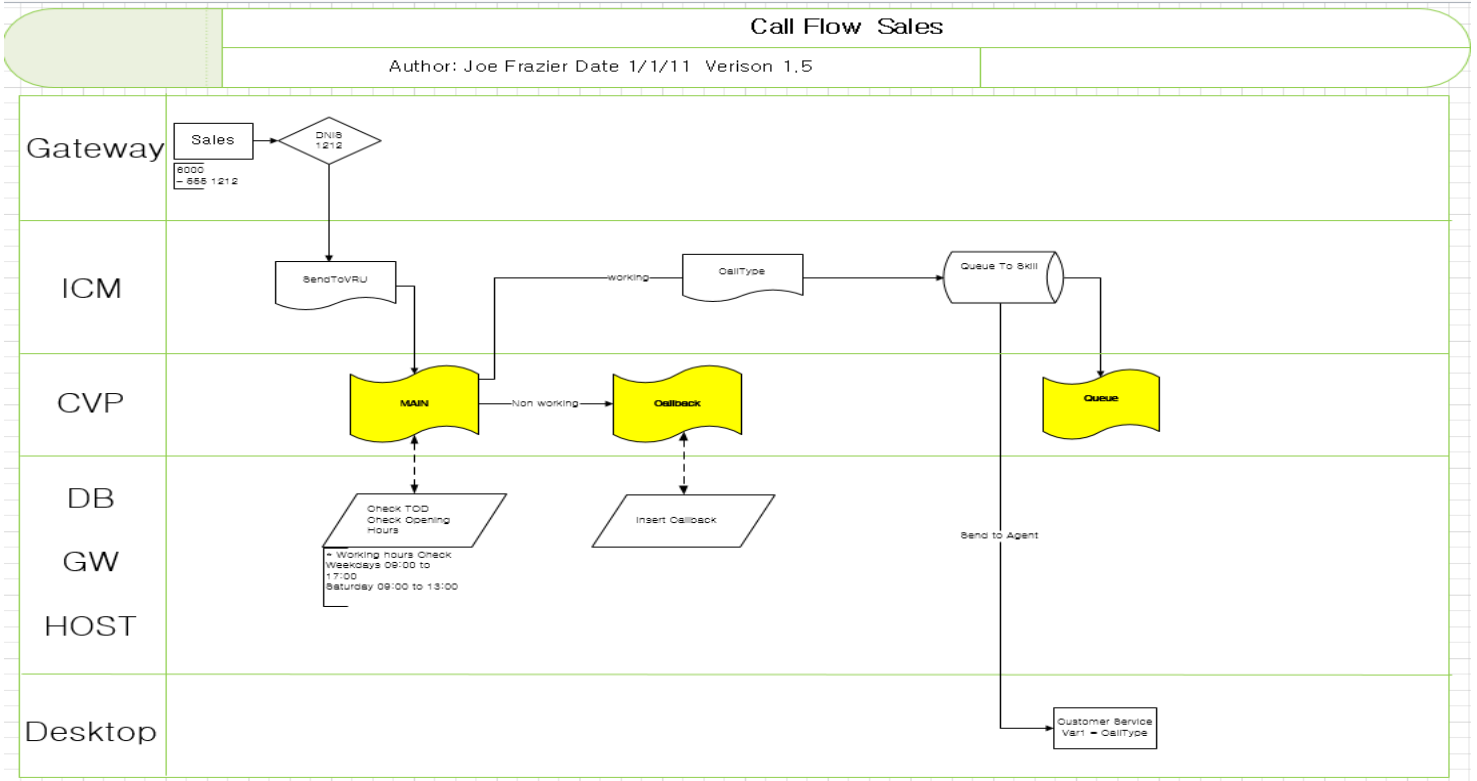
Application Requirements – IVR Call Tree for ACME



Application Requirements – ICM Call Flow for ACME

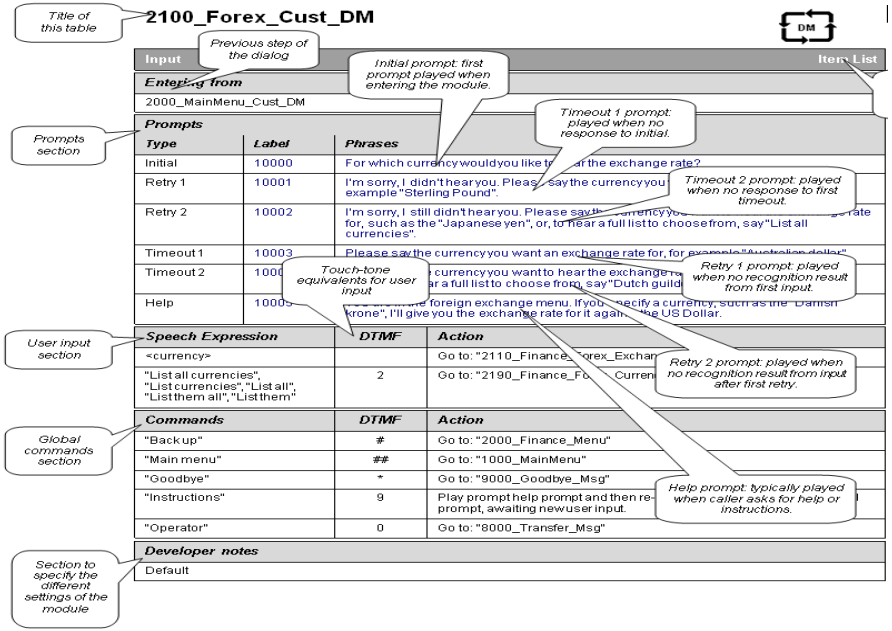


Application Requirements – ICM Call Flow for ACME

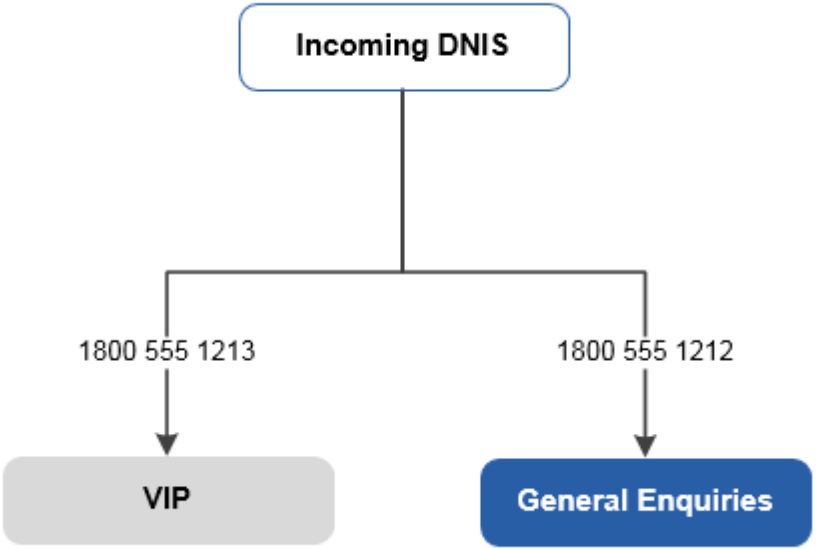


Application Requirements – User Interface

A document that contains the detailed explanation for each node in the call flow.



Application Requirements – DNIS Routing



ACME Requirements - Document

Supervisor Requirements

Ref. No.	Description
[REQ-43]	There will be 5 to 20 agents per supervisor.
[REQ-44]	Supervisors will have the ability to Hot desk
[REQ-45]	Supervisors may use auto answer or manual answer

Discussed but not in scope

Ref. No.	Description
[REQ-203]	Syslog is not required

Design - Architecture

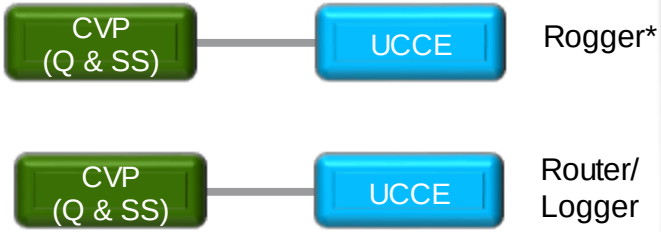
Enterprise Reference Design Models – 10.5

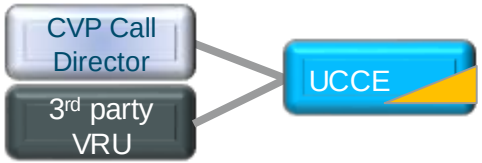
Packaged CCE
Total CPS <=8
Up to 1K agents

PCCE

Unified CCE - 4,000 Agents
*Total CPS <= 30 **

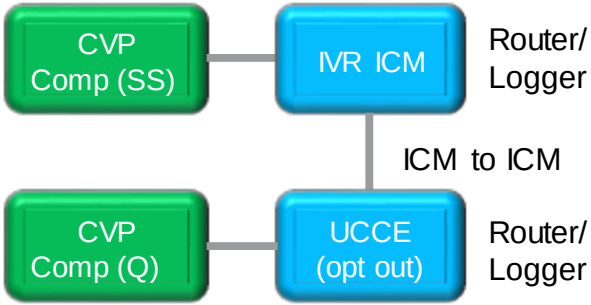
Unified CCE - 12,000 Agents
Total CPS <= 90

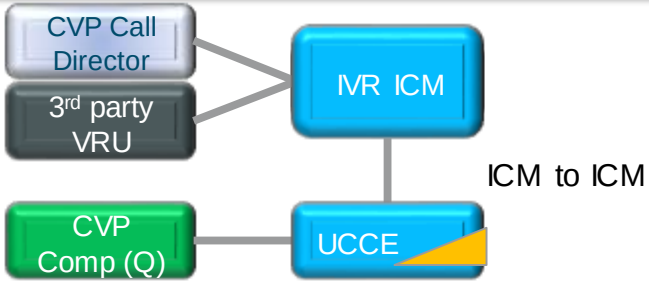




Large Unified CCE

Total CPS < 300
Total Agent CPS <= 90 CPS.
Up to 12K agents





Question Time

Which Reference Design fits the above customer scenario?

a) PCCE
b) Unified CCE 12K
c) Large Unified CCE

How many instances of the Reference Design are needed?

a) One
b) Two
c) Three

Question Time

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Design - Topologies

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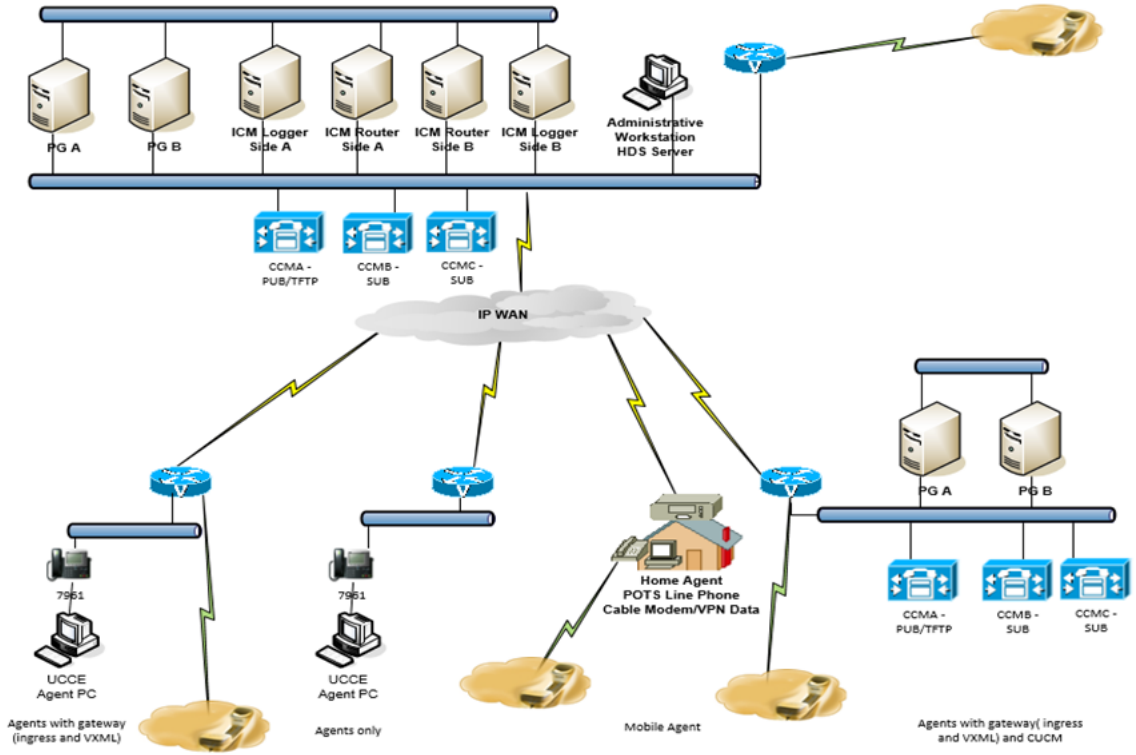
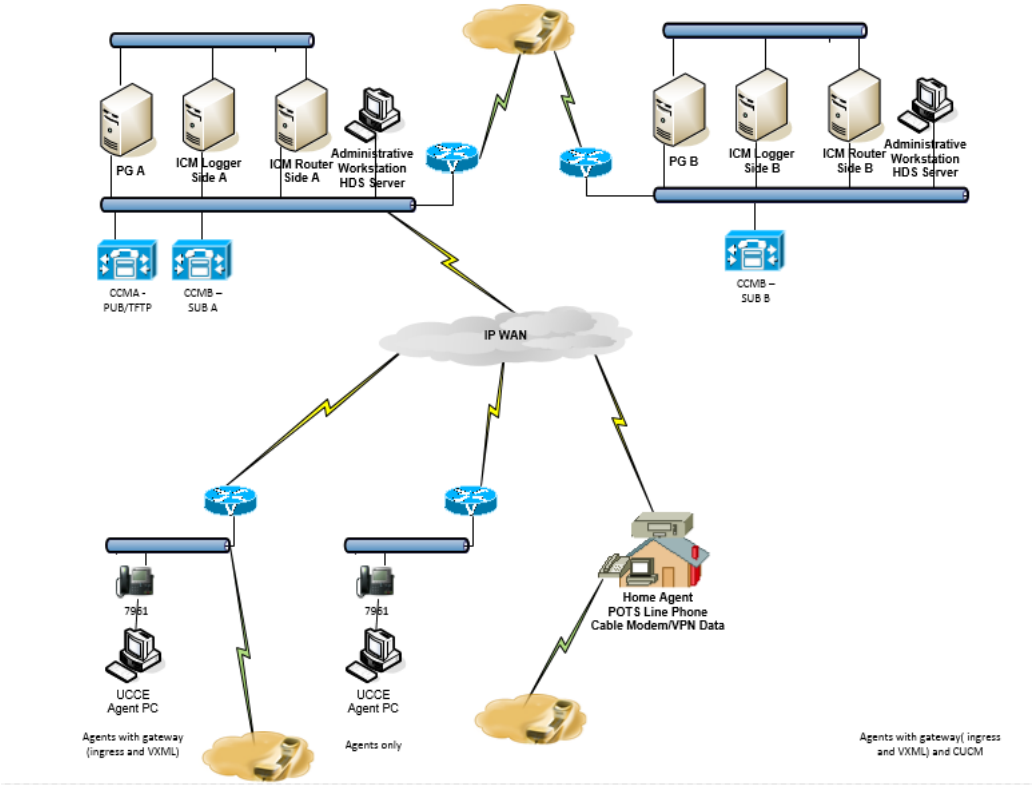
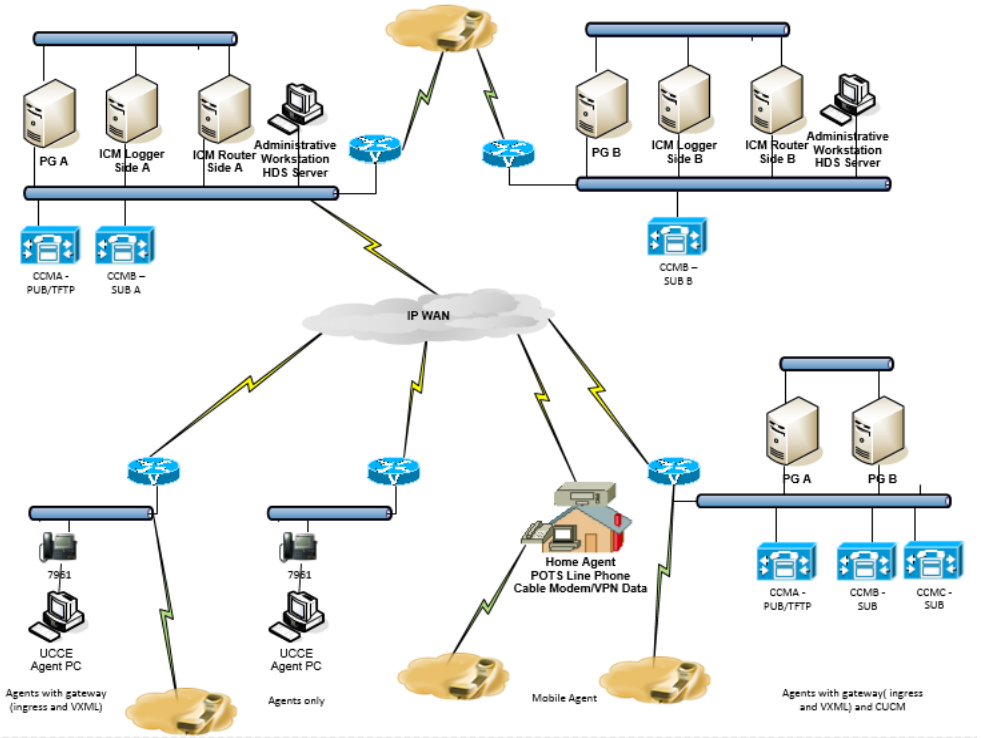
Centralised Data Centre



Geographic Data Centre



Geographic Data Centre with Distributed UCM Clusters



Question Time

Which topology fits the customer requirements?

a) Centralised Data Centre

b) Geographically Split Data Centre

c) Geographically Split Data Centre with distributed clusters

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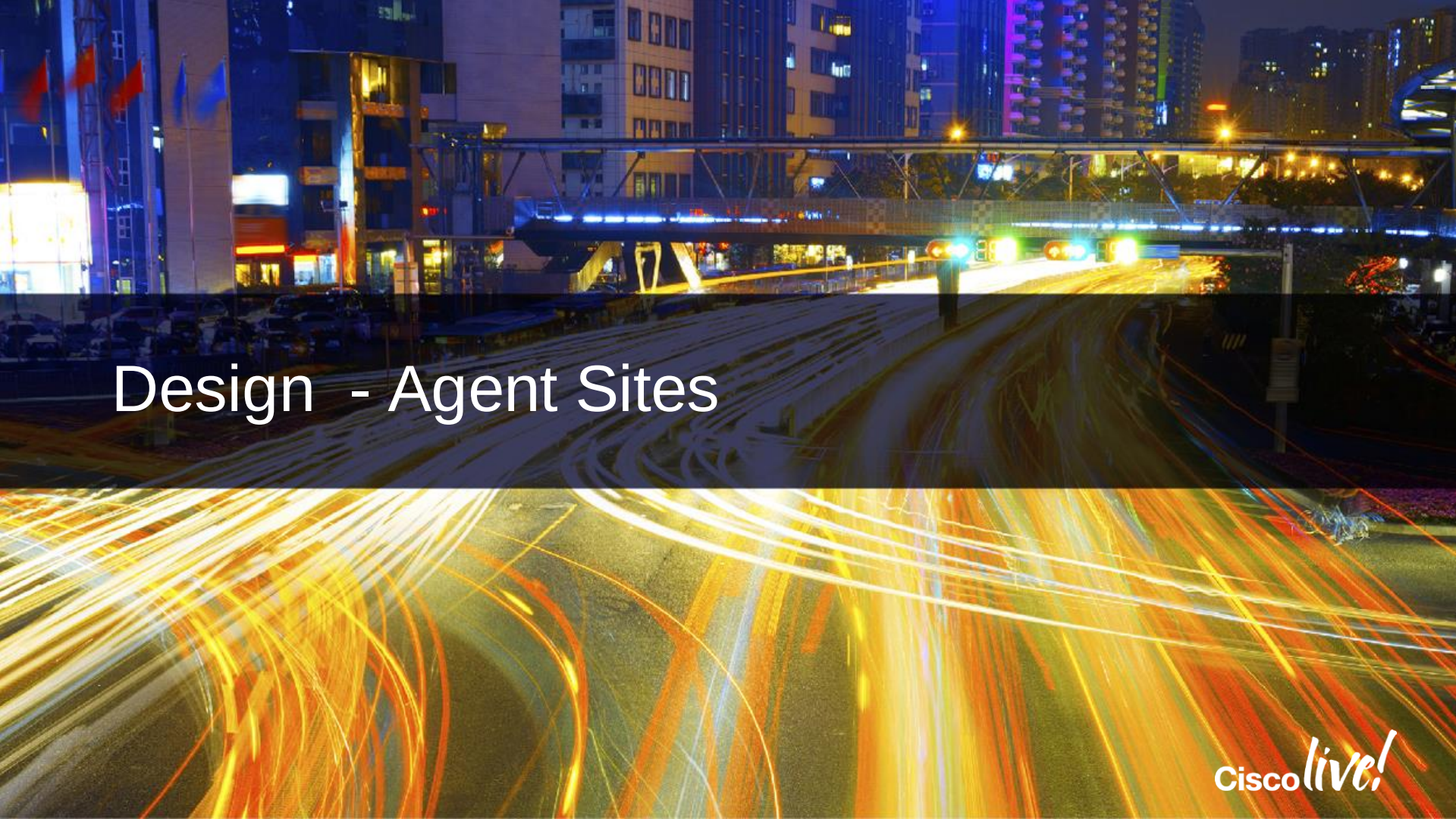

Design - Agent Sites

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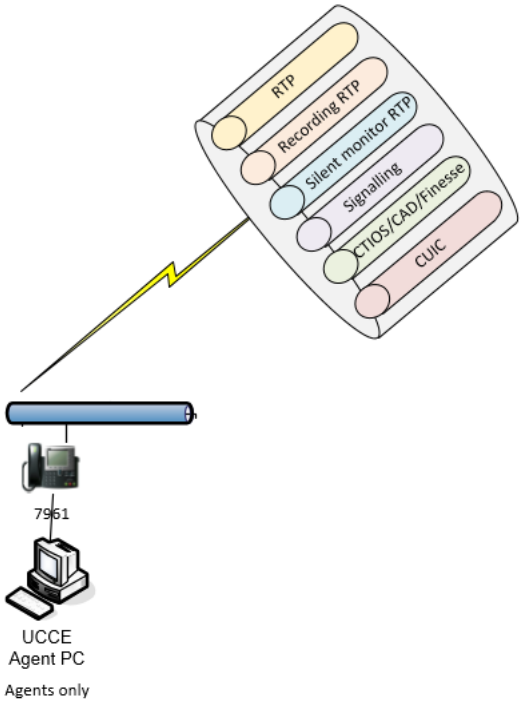
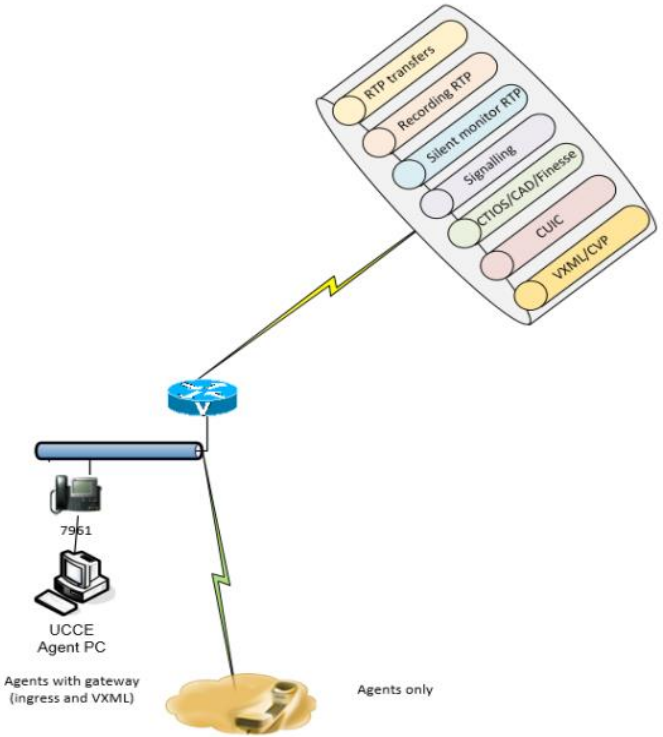
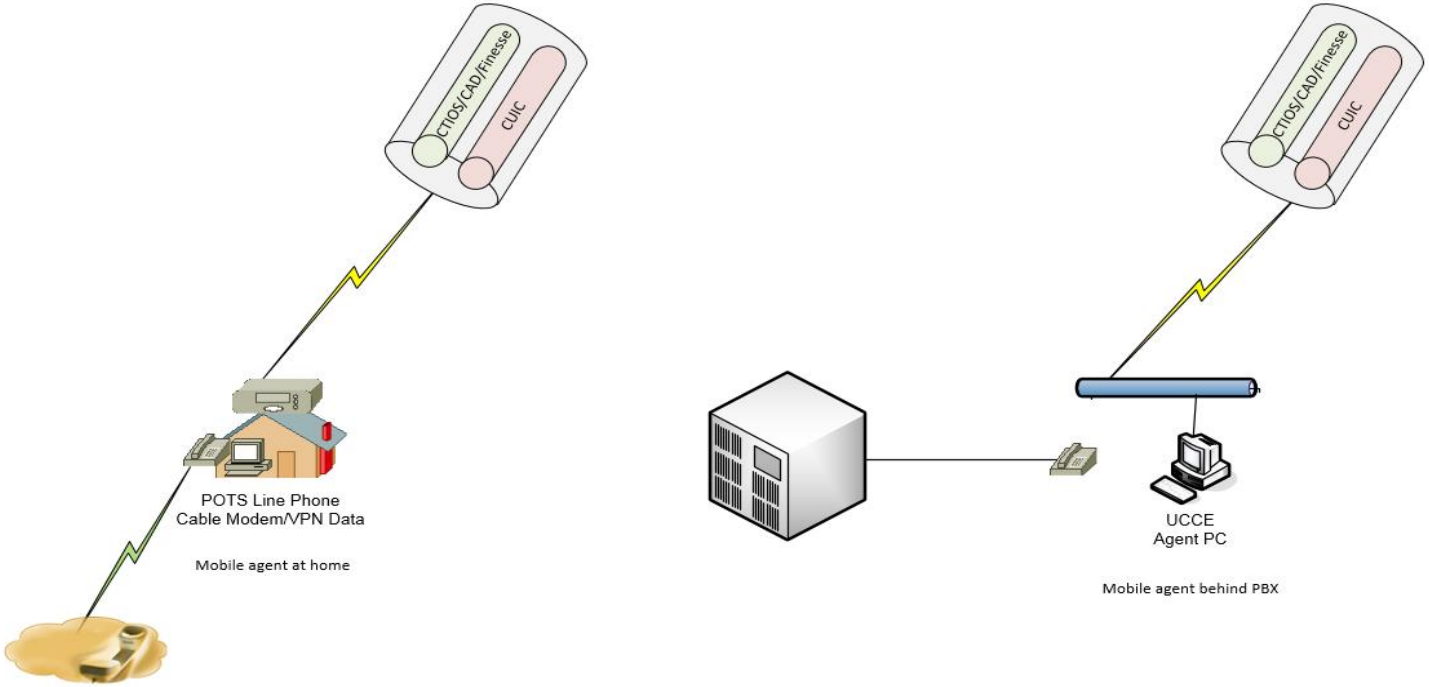
Agent Sites – Phone and PC



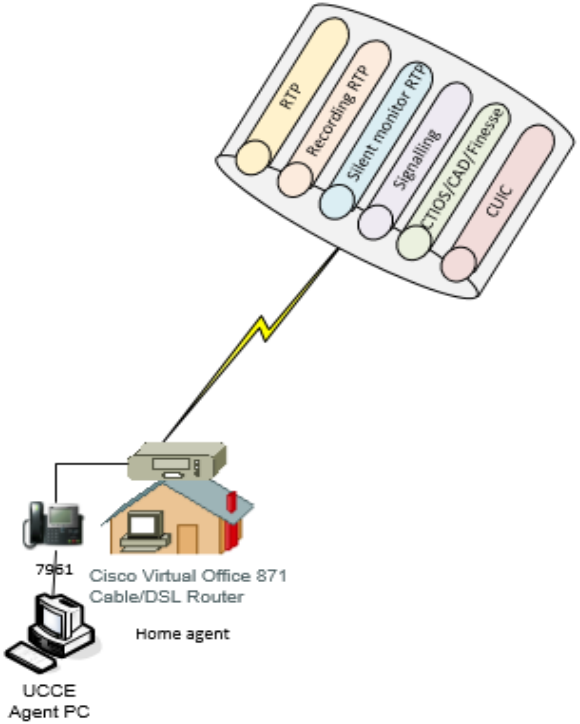
Agent Sites – Phone, PC and Local Gateway



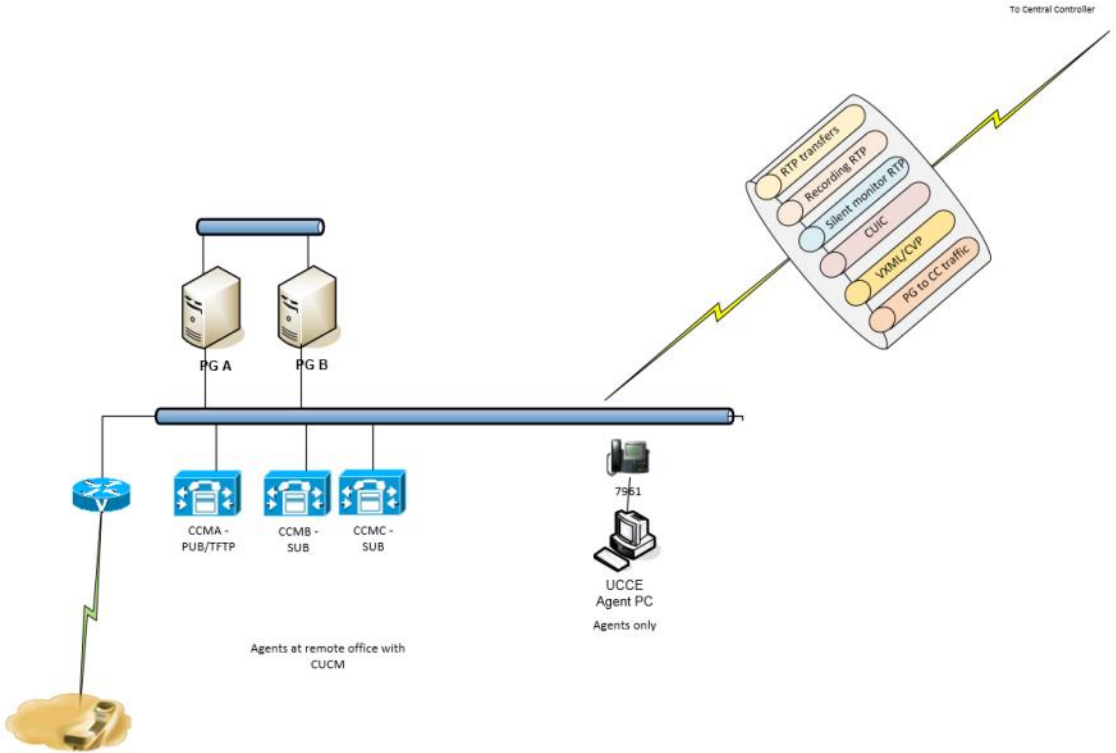
Agent sites – Mobile Agent



Agent sites – Home Agent



Agent at Remote Office with CUCM



Question Time

Which site topology fits our customer requirements?

a) Agent with ip phone
b) Agent with iphone with local gateway
c) Mobile agent at home
d) Mobile agent behind PBX
e) Home Agent
f) Agent with ip phone with local gateway and local CUCM cluster

Question Time

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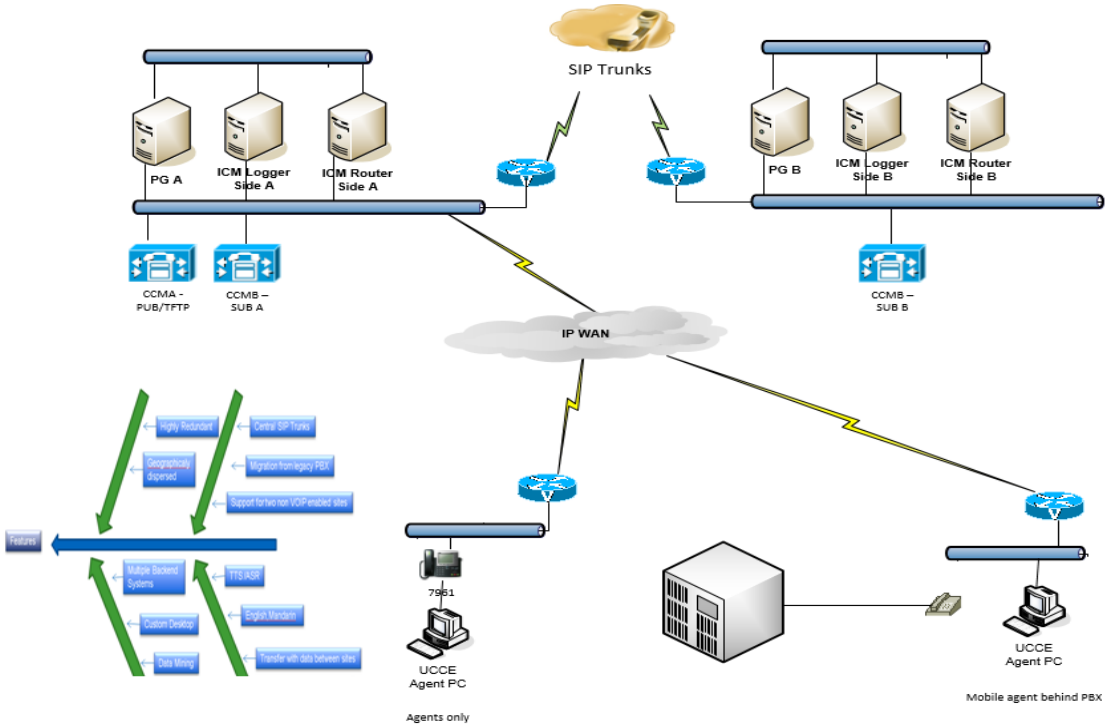
Geographically Split DC with Agent Site Choice



Design - Components

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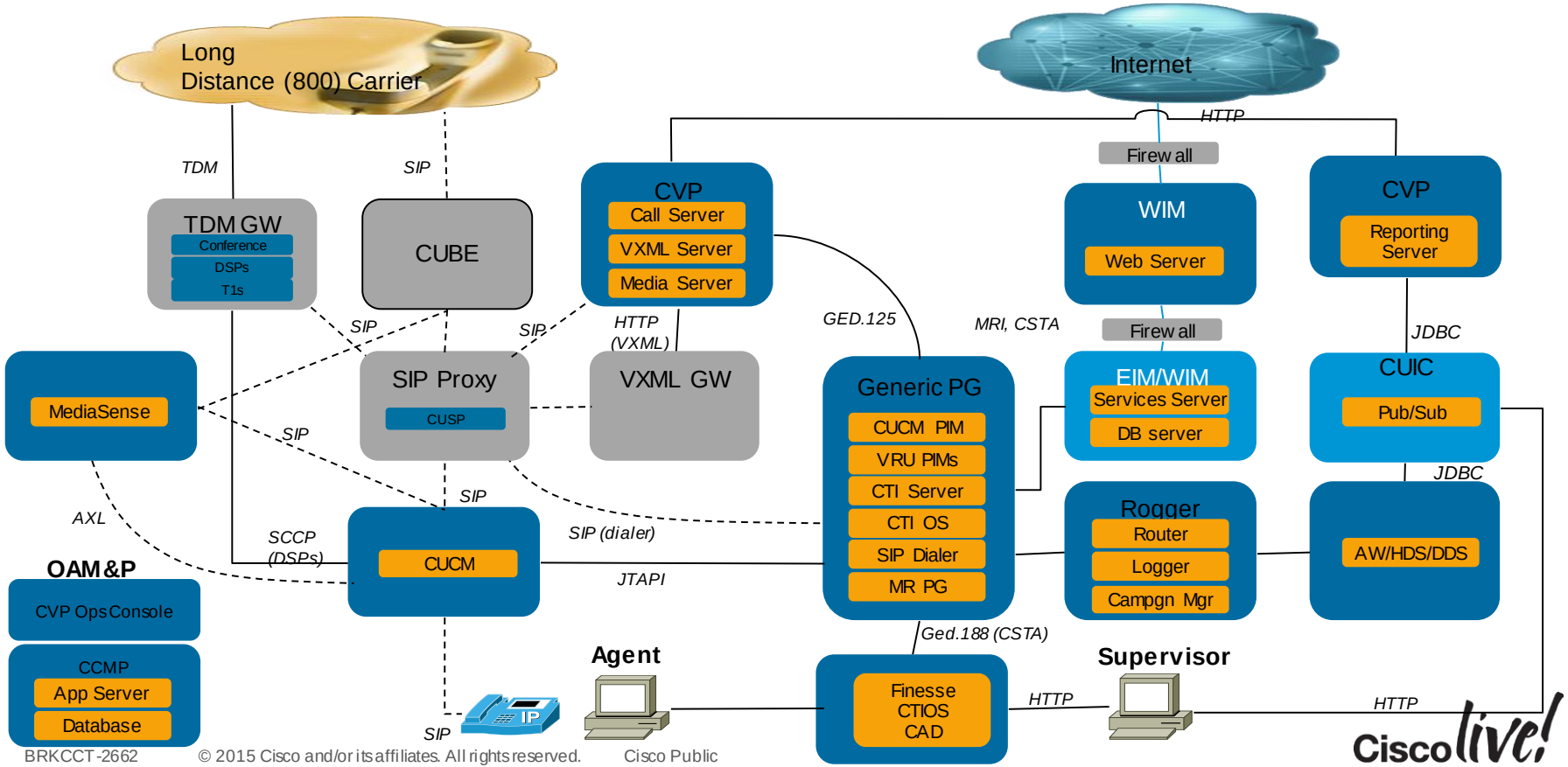
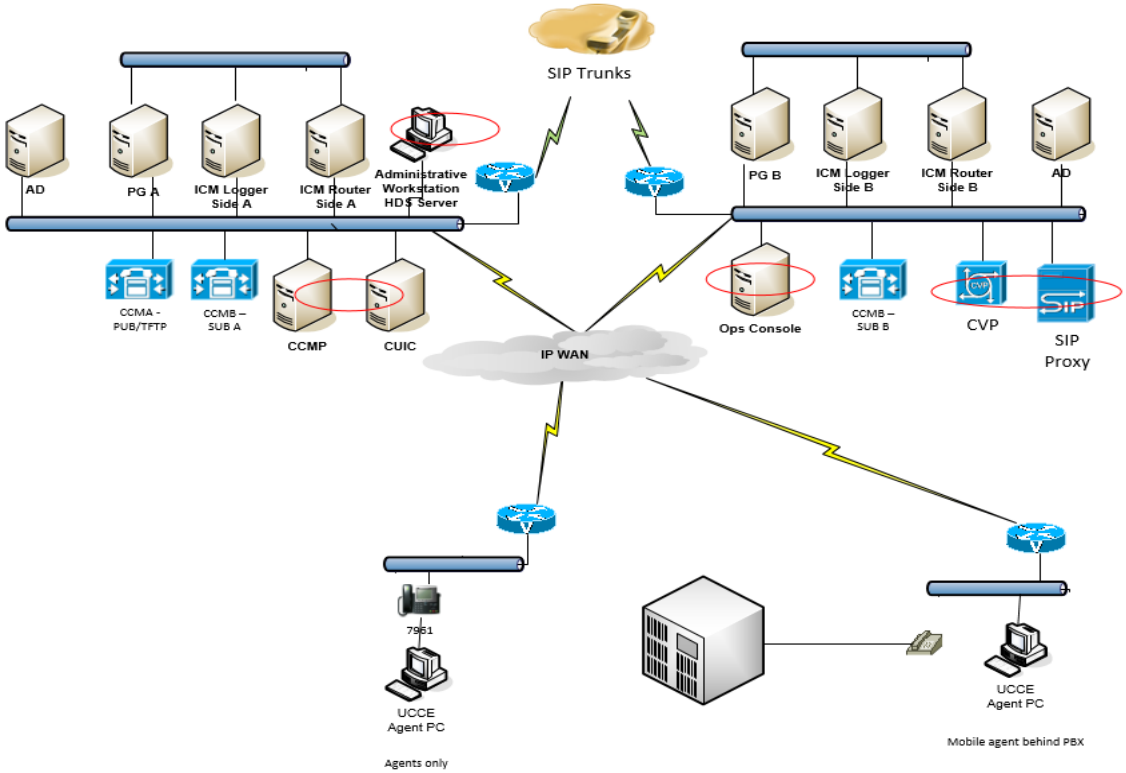
Data Centre: Logical View



Design with Components



What UCS
"B-Series"

- Half-width blade server form factor
- Best for
  - ✓Medium to high server count & concentration
  - ✓Existing or planned data centre
  - ✓Operational "Maturity"
- Requires SAN storage for UC/CC applications
- Leverages UC Fabric Interconnect switches for LAN and SAN connectivity

What UCS
"C-Series"

- Rack server form factor
- Best for
  - Low to medium server count
  - Ready to move off an appliance model (server/VMware admin)
  - Preference for rack server form factor
  - Interim migration step for data centre solution

Which UCS Should Be Chosen?

- C series
- B series

Choose Your Versions

Component Compatibility for Unified 10.5(1)

Unified CM[4]	IVR (IP-IVR and CVP)	PG/Cisco Agent Desktop/CTI OS Server[1,2]	CTI OS Desktop[1]	Unified Intelligence Center	Unified WIM and EIM	Siebel CRM	RSM	Unified CCMP	MediaSense	SocialMiner	Finesse
10.5(1)	IP-IVR 10.5(1) 10.0(1) 9.0(2) CVP 10.5(1) 10.0(1) 9.0(1)	PG 10.5(1) Cisco Agent Desktop 10.0(1a) CTI OS Server 10.5(1)	10.5(1) 10.0(x) 9.1(2)	10.5(1)	Unified WIM and EIM 9.0(2) Unified WIM and EIM 9.0(1)	CRM for Siebel 8.0(x) 8.1(x)	10.0(1) 9.0(1) 9.1(1)	10.5(1)	10.5(1)	10.5(1)	10.5(1)

http://docwiki.cisco.com/wiki/Unified_CCE_Software_Compatibility_Matrix_for_10.5%28x%29

Hardware and System Software Specification for Cisco Unified Customer Voice Portal 10.5(1)

Design - Sizing

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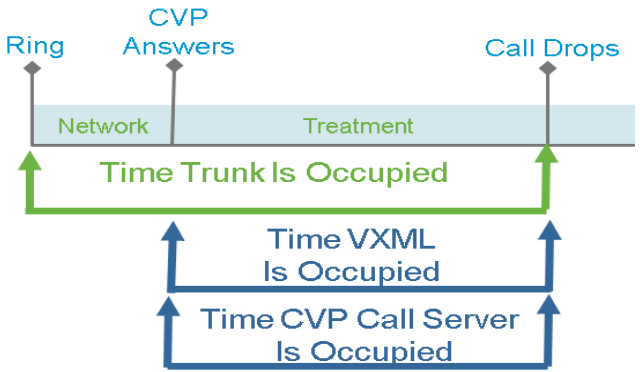
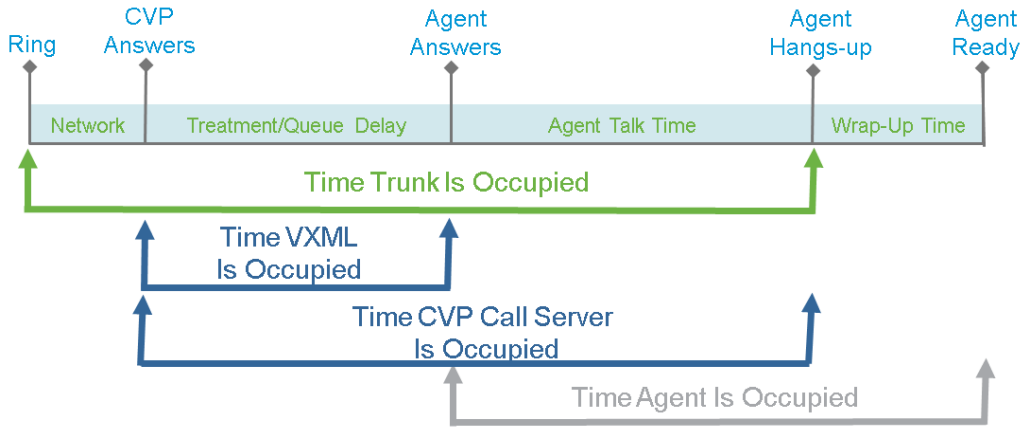
Design – Sizing Call Flows

Self Service



Call To Agent after Self Service



Design – Sizing Tool

UCCE Inbound	Inputs	Defaults
Number of Incoming Calls Per Hour	120,000	0
Service Level Goals	80.00%	90%
Target Answer Time (sec)	20	30
Call Blocking Probability At VGW	1%	1.00%
Call Blocking Probability At VRU	0.10%	0.10%
Average Number Of Agents Per Supervisor	9	9

http://tools.cisco.com/cucst

	% Total Calls	Avg Treatment Time - VRU (sec)	Avg Call Talk Time (sec)	Avg Warp-Up Time (sec)	Wait Before Abandon Tolerance (sec)	% Transfer	After Transfer Talk Time	% Conference	% Calls Silent Monitor (UCM)	% Calls Recorded by UCM (BIB)	% Calls Recorded by CUBE	% Calls with Post Call Survey	Avg Treatment Time for Post Call Survey (sec)	% Calls with Courtesy Call Back	% Calls with Whisper Announcements	AHT for Whisper Announcements (sec)	% Calls with Agent Greeting	AHT for Agent Greeting (sec)
Default	100%	60	180	60	150	10%	60	5%	0%	0%	0%	0%	120	0%	0%	30	0%	5
Callflow 1	35%	30	0	0	150	0%	60	0%	0%	0%	0%	0%	120	0%	0%	30	0%	5
Callflow 2	65%	30	180	60	120	5%	43	3%	0%	0%	0%	0%	100	0%	0%	24	0%	4

Results

VRU Theoretical Ports per Traffic Type		
	Queue	282
	Call Treatment	1098
	Outbound	0
	Total	1380
GW Theoretical Ports per Traffic Type		
	Inbound (Queue+Treatment+Talk Time)	5327
	Mobile Agents	0
	Outbound	0
	Total	5327
Agents & Supervisors		
Inbound		
	Local	5738
	Mobile	0
	Nailed Up	0
	Call by Call	0
Outbound		
	Local	0
	Mobile	0
	Nailed Up	0
	Call by Call	0
Outbound Dialer Ports		0
Total Agents		5164
Total Supervisors		574
Total Agents & Supervisors		5738

Results

CVP Equipment			
Component	**Platform**	**Utilization**	**Quantity**
CVP Servers	Call/VXML Server	94.33%	14
Required RPT Servers	Reporting Server	32.57%	1

Unified Contact Center Enterprise Equipment			
UCCE Component	**Platform**	**Utilization**	**Quantity**
Router	VM Router 8000 agents	71.73%	2
Router	VM Router 12000 agents	47.82%	2
Logger	VM Logger 8000 agents	71.73%	2
Logger	VM Logger 12000 agents	47.82%	2
AW/HDS	VM HDS-DDS	23.90%	1
AW/HDS	VM AW-HDS-DDS for 12000 agents	18.39%	1
Agent PG	UCM Agent PG	95.63%	6
VRU PGs	VRU PG 9,600 ports 10 pims	30.66%	4
Finesse Server in Pair	500 Agents	95.63%	6

Gateways	
Gateway Group 1: Cisco 3945E	11

Unified Communications Manager	
VM Type	VM - UCM_10000
Subscribers	12
TFTPs VMs	4
Publisher Servers	2

Comments

* Would probably add more reporting servers as per CVP SRND.
* The number of HDS is best increased for redundancy
* Best to have a separate DDS for storage and 3rd party access of TCD's.
* Would have a separate VRU PG pair

Note: Ensure E1 gateway is chosen

VXML

Assume 25 % ASR and 75% DTMF

=> 1380*0.75 = 1035

=> 1380*0.25 = 345

Total = 2 (DTMF) + 1 (ASR) + (N+1 redundant)

= 4 vxml gateways

* ASR is very heavy and have seen 44% CPU usage @453 VXML sessions per voice gateway on a complex script

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Total Agents		5164
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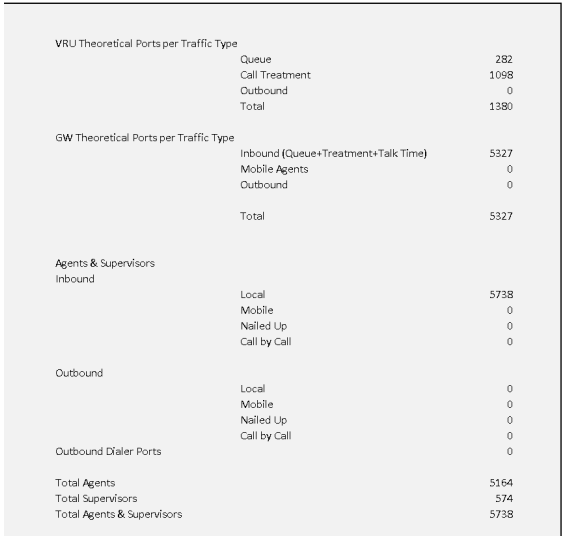
Maximum Number of VoiceXML Sessions Supported by Cisco Voice Gateways (Cisco IOS Release 15.1.4.M7 and Later)

VXML Gateway CPU Capacity for Cisco IOS Release 15.1.4.M7 or Later					
Platform	VXML Only		VXML + PSTN		Memory
	DTMF	ASR	DTMF	ASR	Recommended
3945E	850	570	680	450	2 GB

CUBE Ingress Gateway

"rule of thumb"

ISR G2 scalability in a contact centre environment is roughly 40% below maximum published IPT numbers due to larger SIP message count per call. This means an 3945E can handle **approximately 1,500 concurrent contact centre SIP sessions**.



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Non Redundant CUBES	L2 Box to Box Redundancy	N+1 Redundancy
5327/1500 = 4	4+4 = 8	4+1 = 5

CUBEs should be designed so that the maximum CPU utilization stays under 75-80%

Design – 3rd party CTI All-Event

UCCE 10.5

The max supported "CTI Server All-Event Feed" connections is "7".

A maximum of five monitor-mode connections on the CTI OS server

A combined maximum of nine All-Event clients and monitor-mode connections

```
C:\Users\Administrator.SPROUT>procmon sprt cg1b ctisvr
05:11:14 Trace: EMT Creating Mutex Global\IMTConnect_DisconnectLock
>>>>clients
 Session    Time  Ver Flags     ClientID          AgentID  AgentExt
Signature         Host
       2 02:48:17 15   AUX     CTIOSServer
CTIOSServer        (10.48.36.132:60446)
       5 02:47:46 14   AUX     ClientID                             CAD Enterprise
S  (10.48.36.131:61026)
       6 02:47:43 14   AUX     10.48.36.131 Acm                     10.48.36.131
Acm  (10.48.36.131:61035)
       8 02:37:25 9           Administrator
Administrator      (10.48.36.137:4844)
      19 01:55:32 15   AUX     CTIOSServer
CTIOSServer        (10.48.36.131:62783)
      40 00:02:22 14   AUX     ClientID                             CAD Enterprise
S  (10.48.36.132:51834)
>>>>
```

Doing a "CTI OS" deployment the usable connection reduces to "5" for external applications.

DSP Calculation

www.cisco.com/web/applicat/dsprecal/dsp_calc.html

DSP Calculator

Router: 3945E IOS: 15.1(3)T

Voice IP Services	Low Complexity	Voice Codecs Medium Complexity	High Complexity	
Transcoding				
Universal Transcoding				
Voice Conferencing	G.711	G.729	G.722	iLBC
8-Party	100			
16-Party				
32-Party				
64-Party				

Secure IP Services	Low Complexity	Medium Complexity	High Complexity	
Secure Transcoding				
Secure Universal Transcoding				
Secure Voice Conferencing	G.711	G.729	G.722	iLBC
8-Party				

Requirement:

100 conference channels

Router: 3945E

IOS: 15.1(3)T

DSP Modules Required:

PVDM3-256: 1

PVDM3-16: 1

DSP Module Allocation:

Router Slot 0: 266 Voice (98%) 6 Available (2%)

PVDM Slot 0/0: PVDM3-256 PVDM Slot 0/1: PVDM3-16

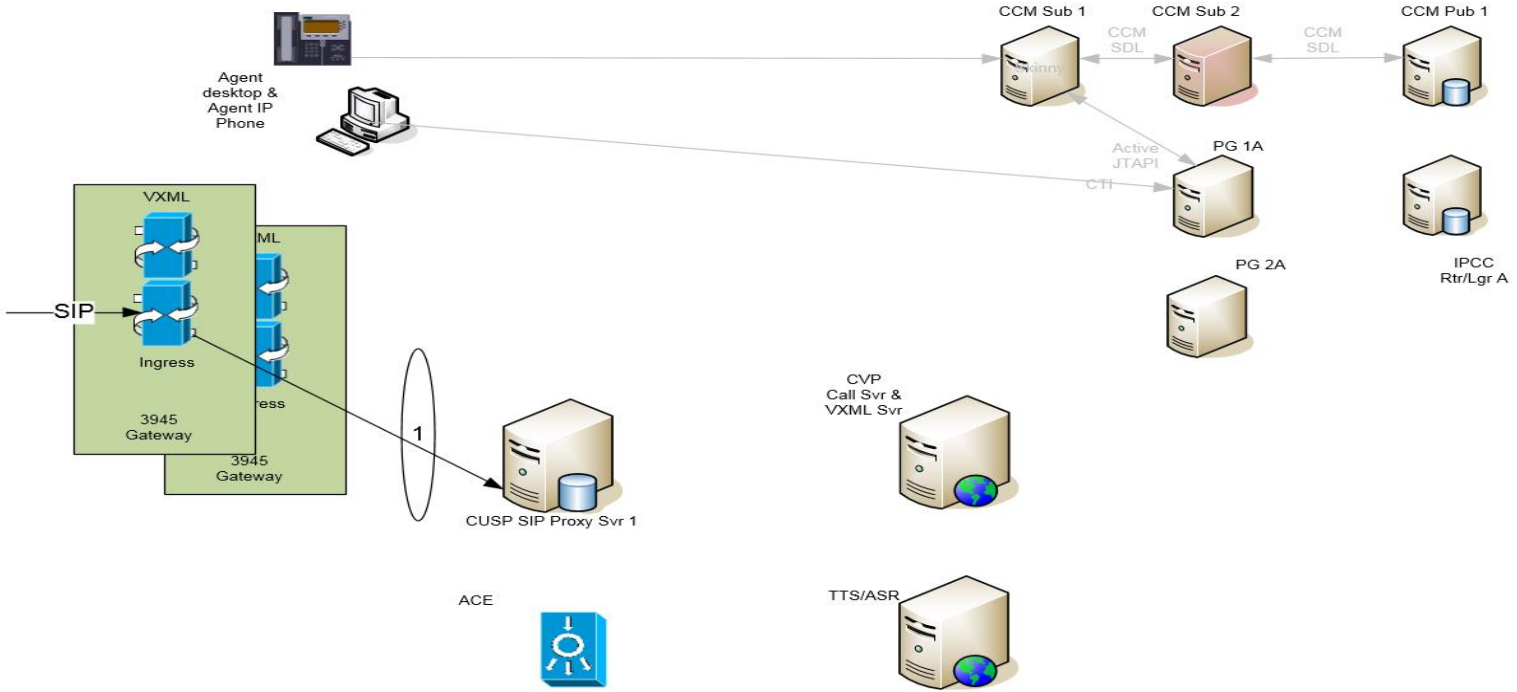
Conference 8 Party G.711: 100

Cisco live!

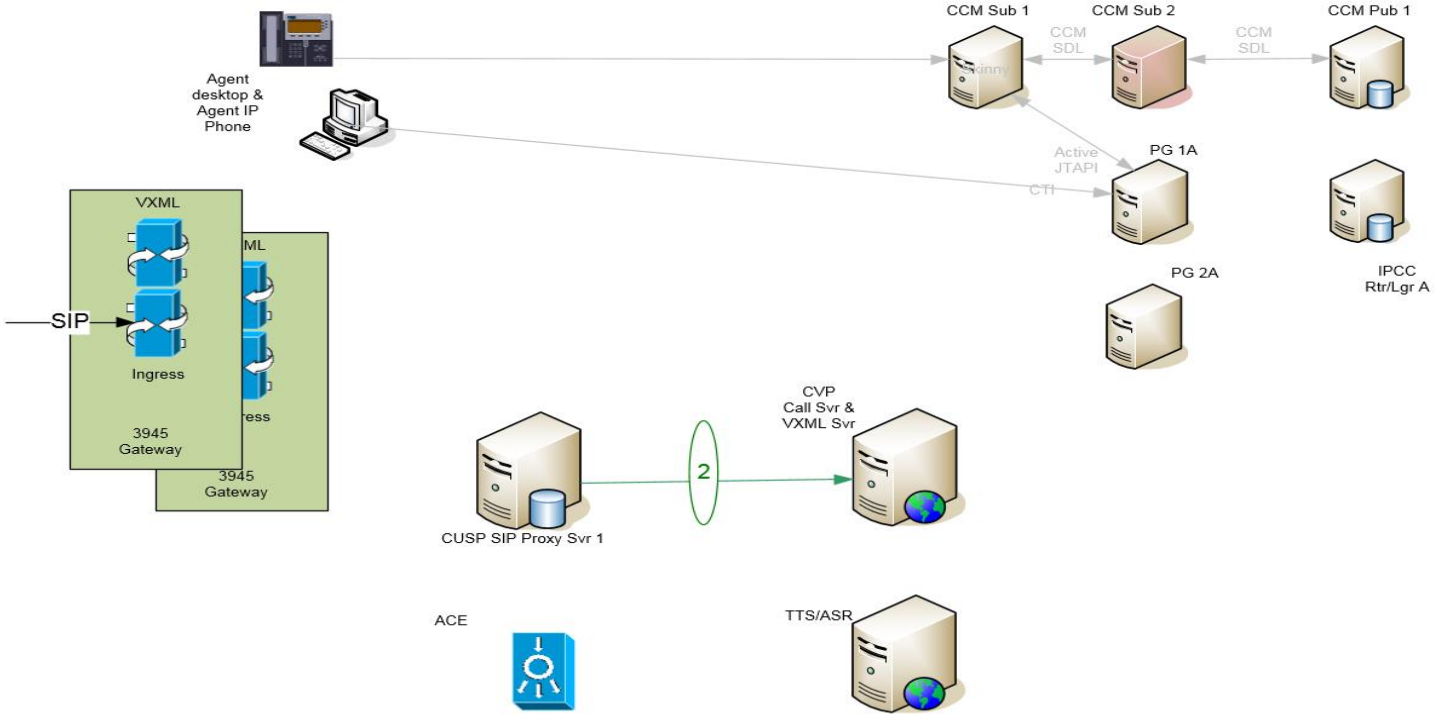
Design – Infrastructure Call Flow

Cisco live!

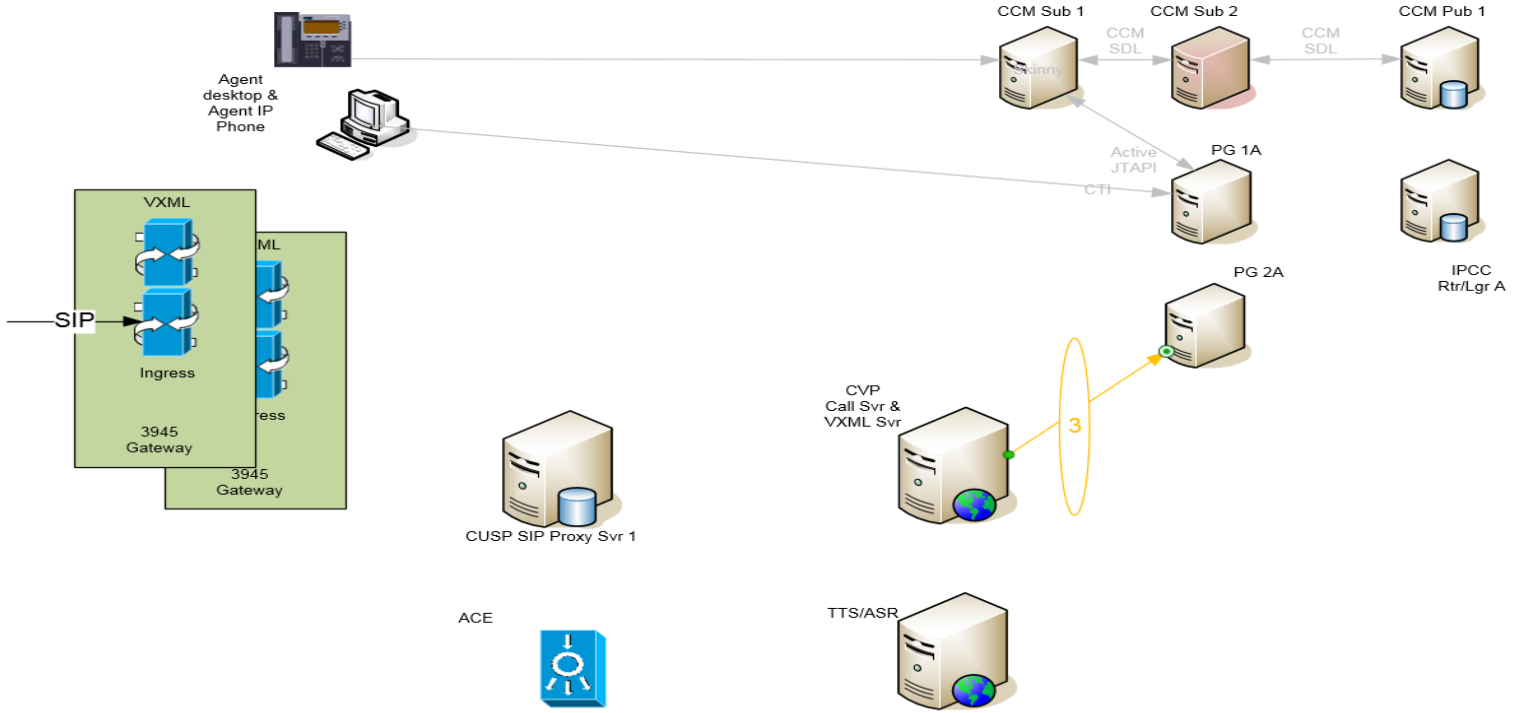
Call Flow - Call Arrives. Contacting a SIP Proxy



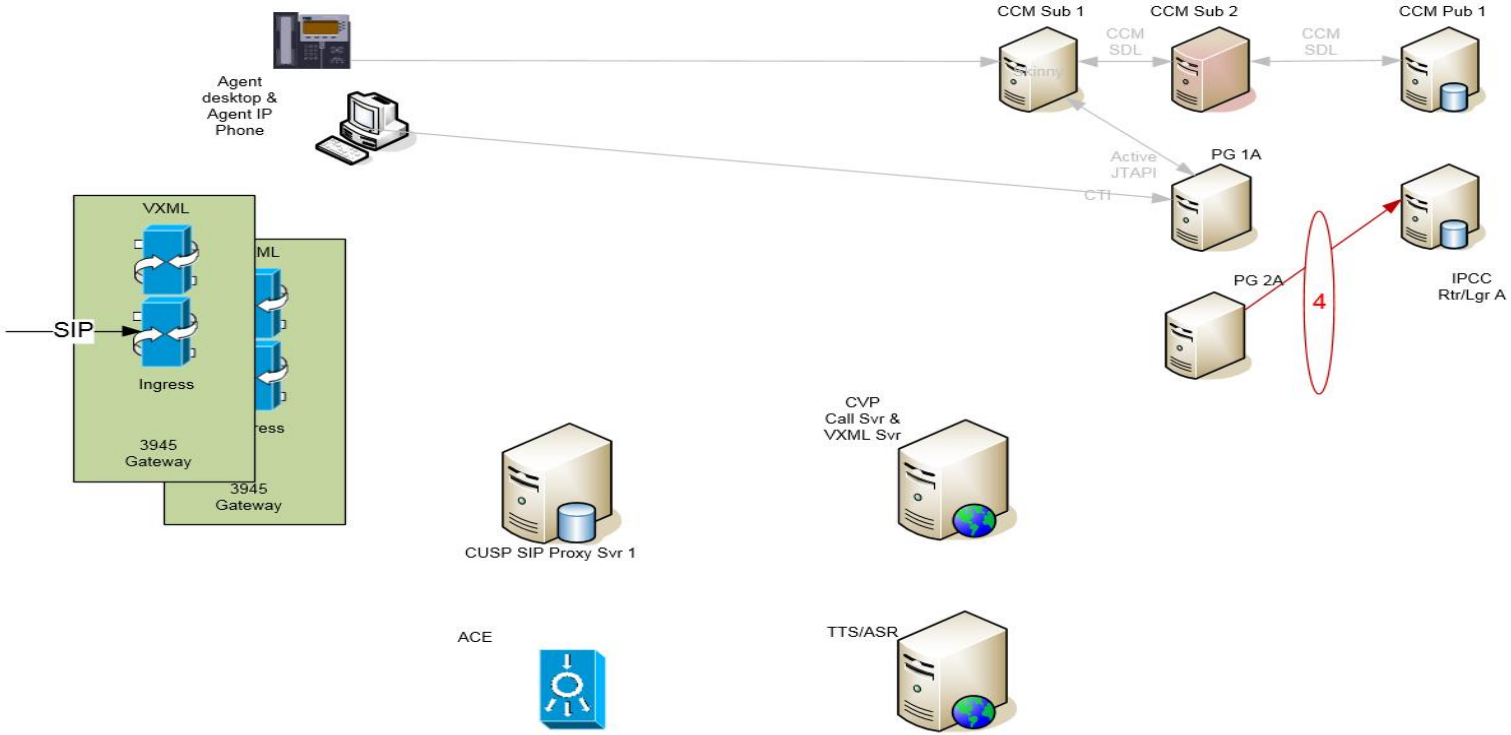
Call Flow – Contacting the CVP Server



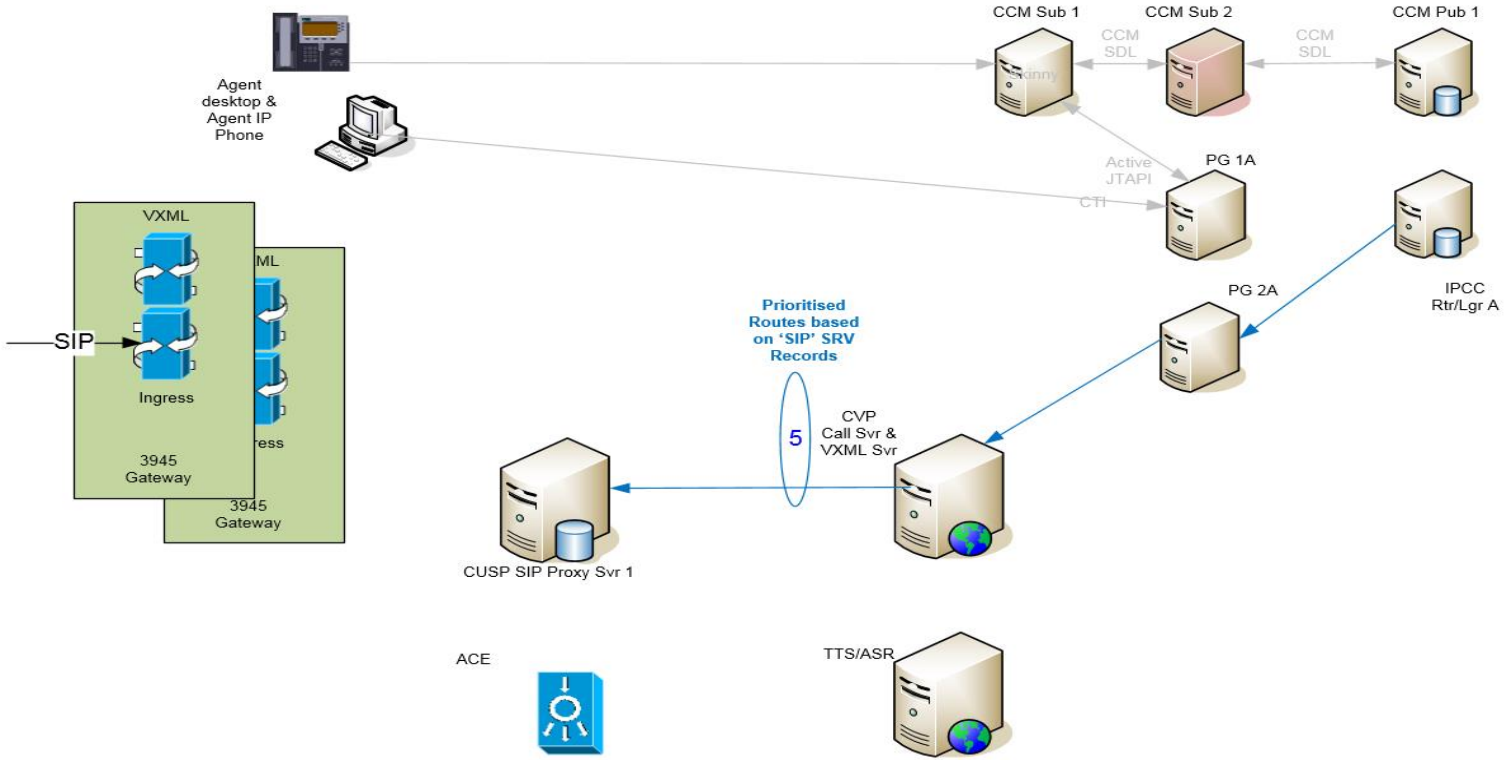
Call Flow – Passing the Request to the PG



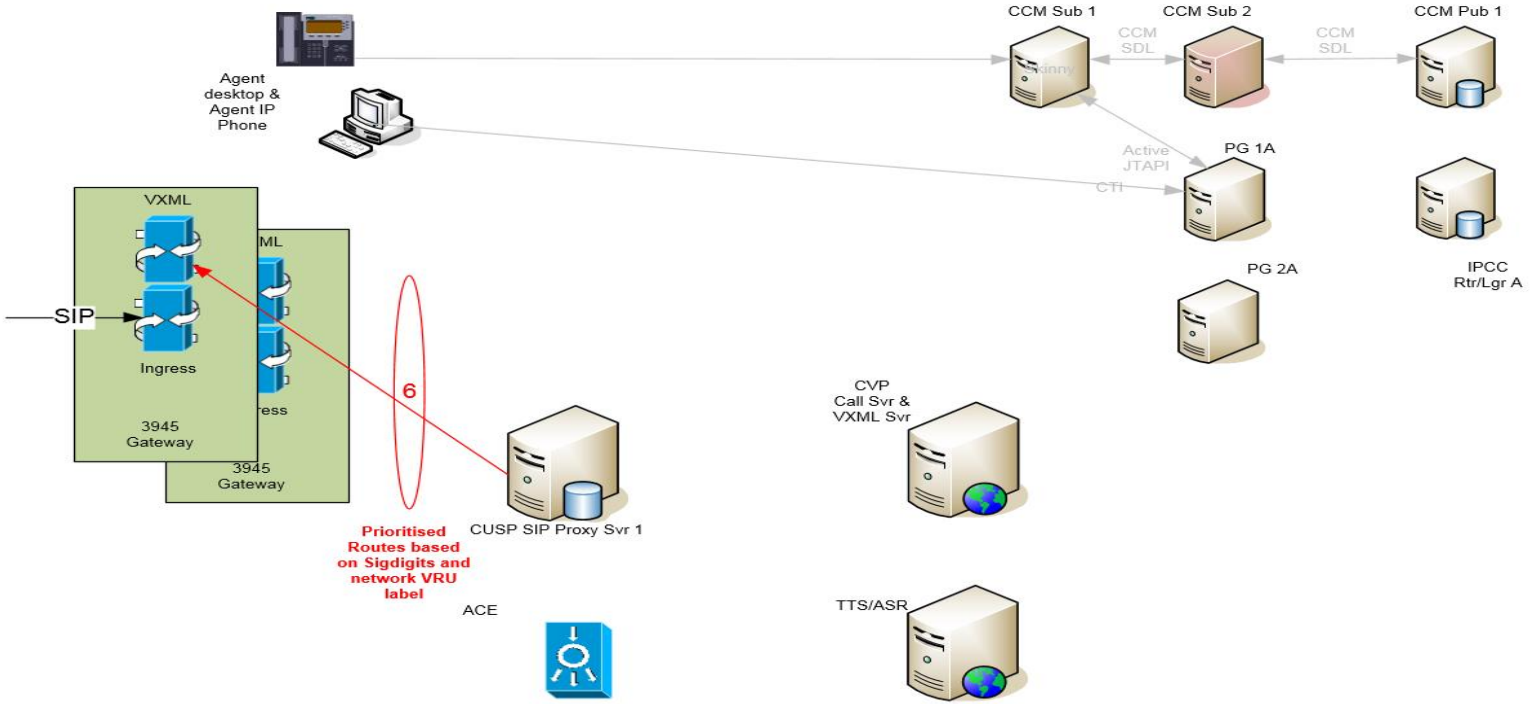
Call Flow- Contacting the Router



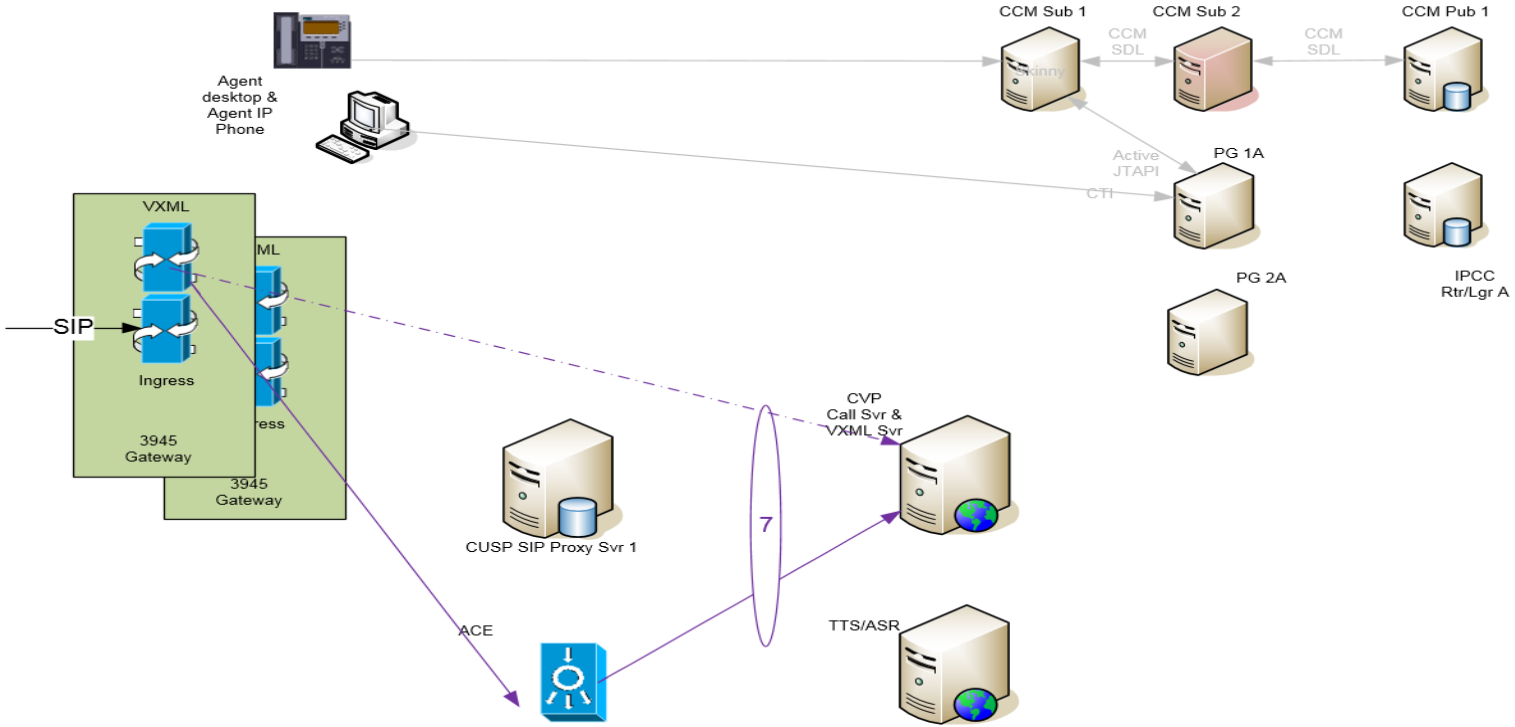
Call Flow - SentToVRU



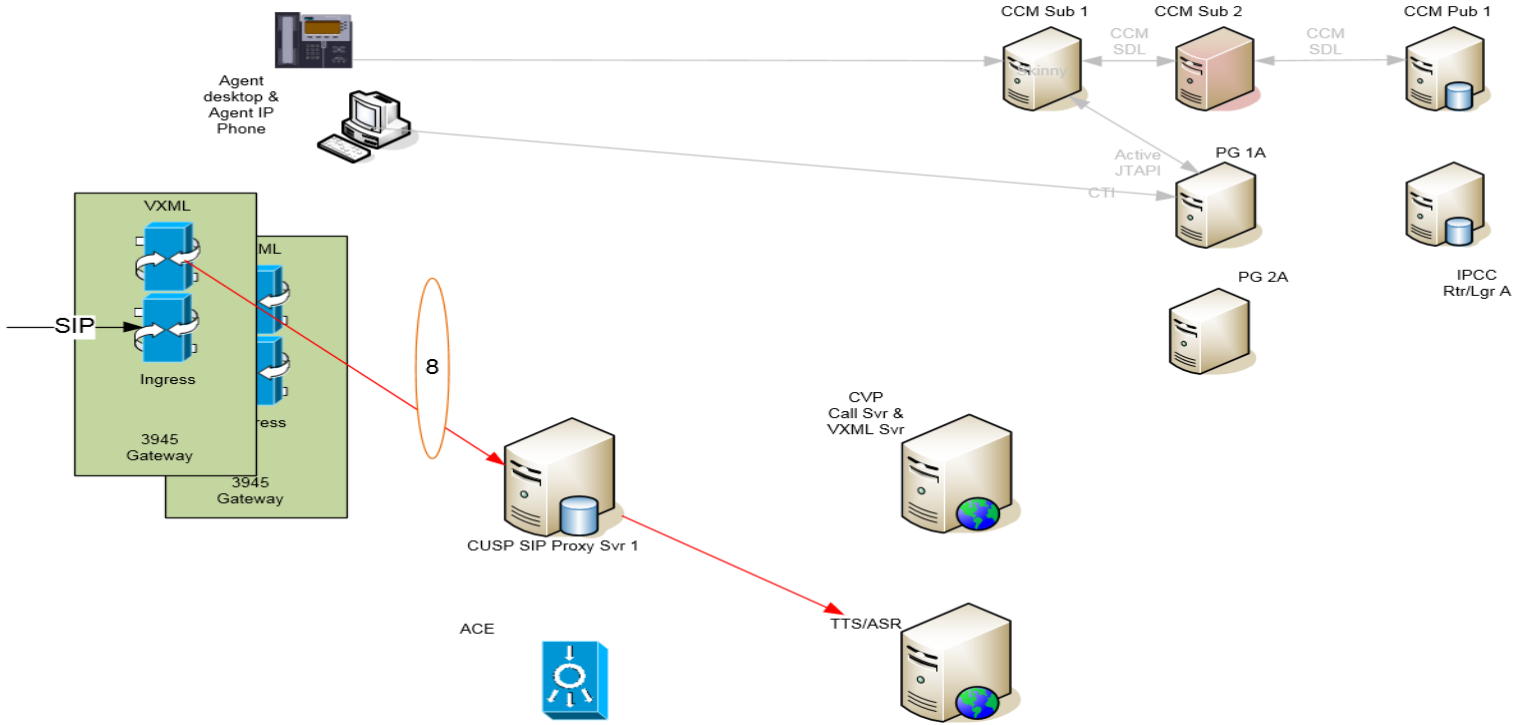
Call Flow – Contacting the VRU leg



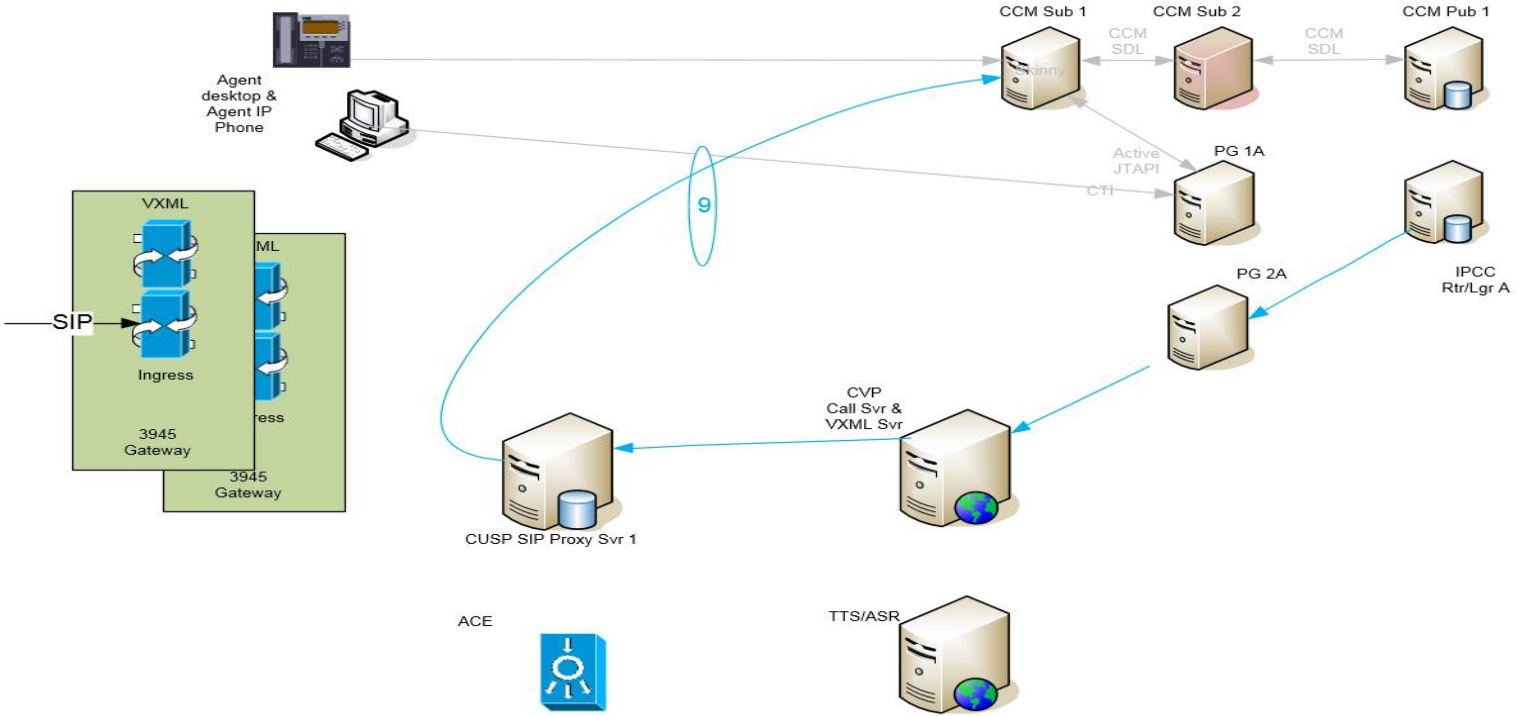
Call Flow – Finding an Available VXML Server



Call Flow – Finding an Available mrcp v2 TTS/ASR



Call Flow – Finding an Available Call Manager Subscriber



Design - Redundancy

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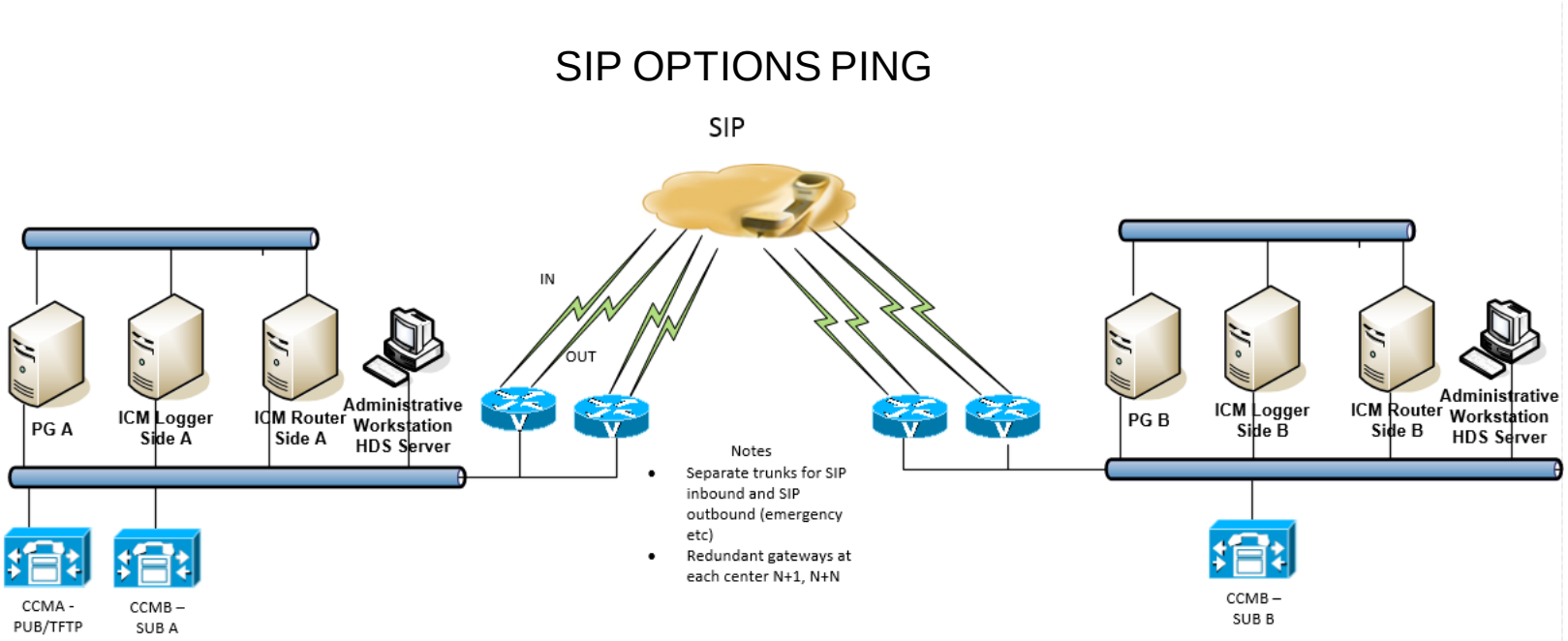
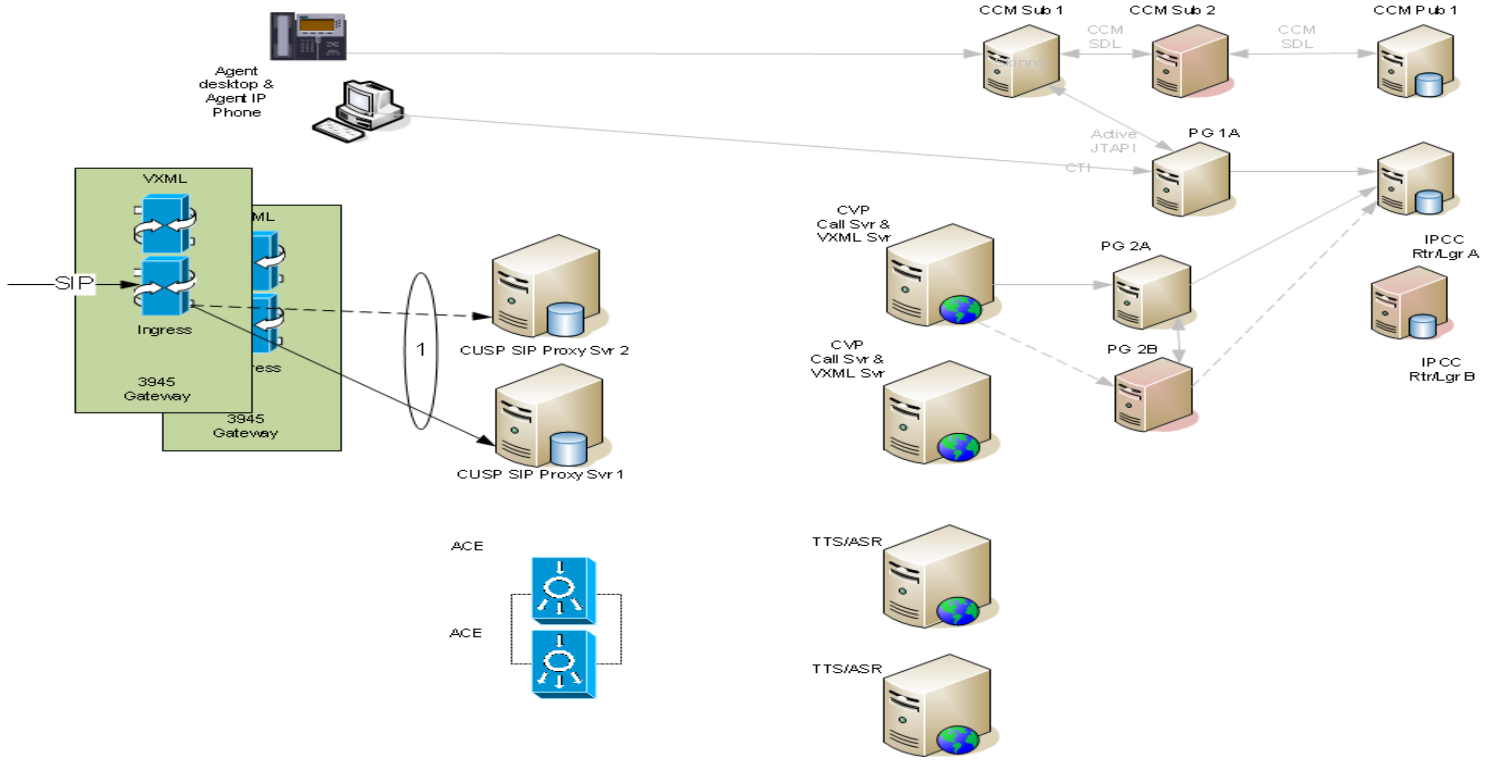
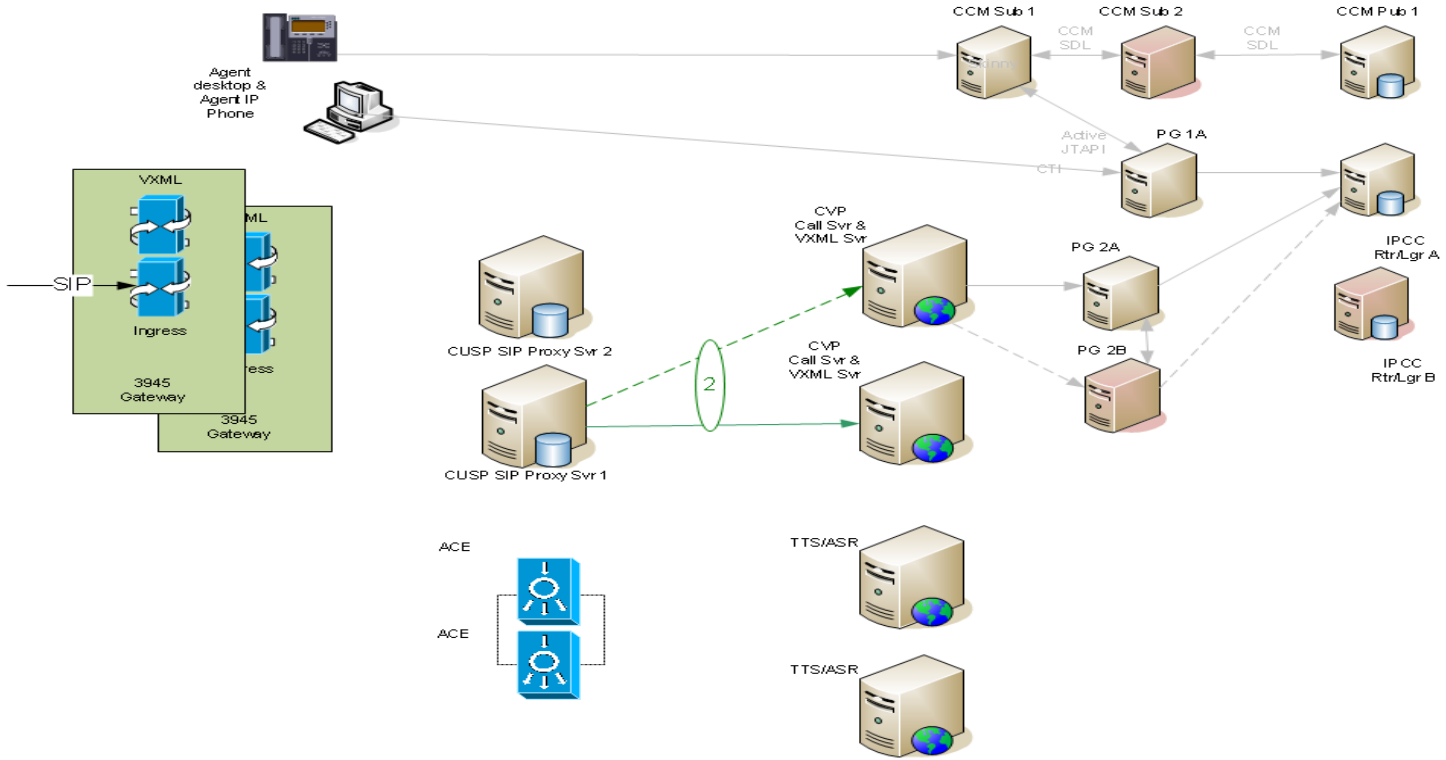
Call Flow – Inbound and Outbound



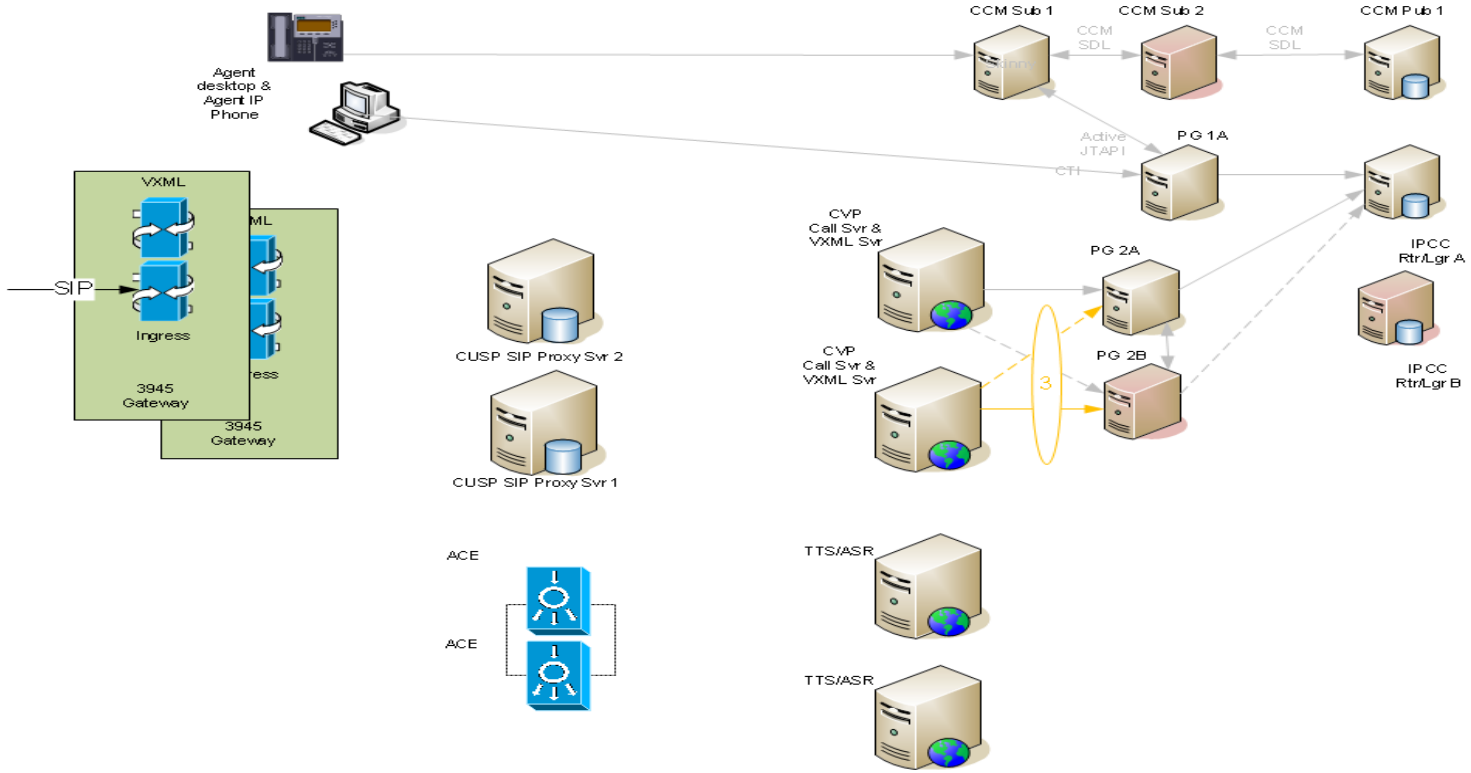
Call Flow - Call Arrives. Finding an Available CVP Server



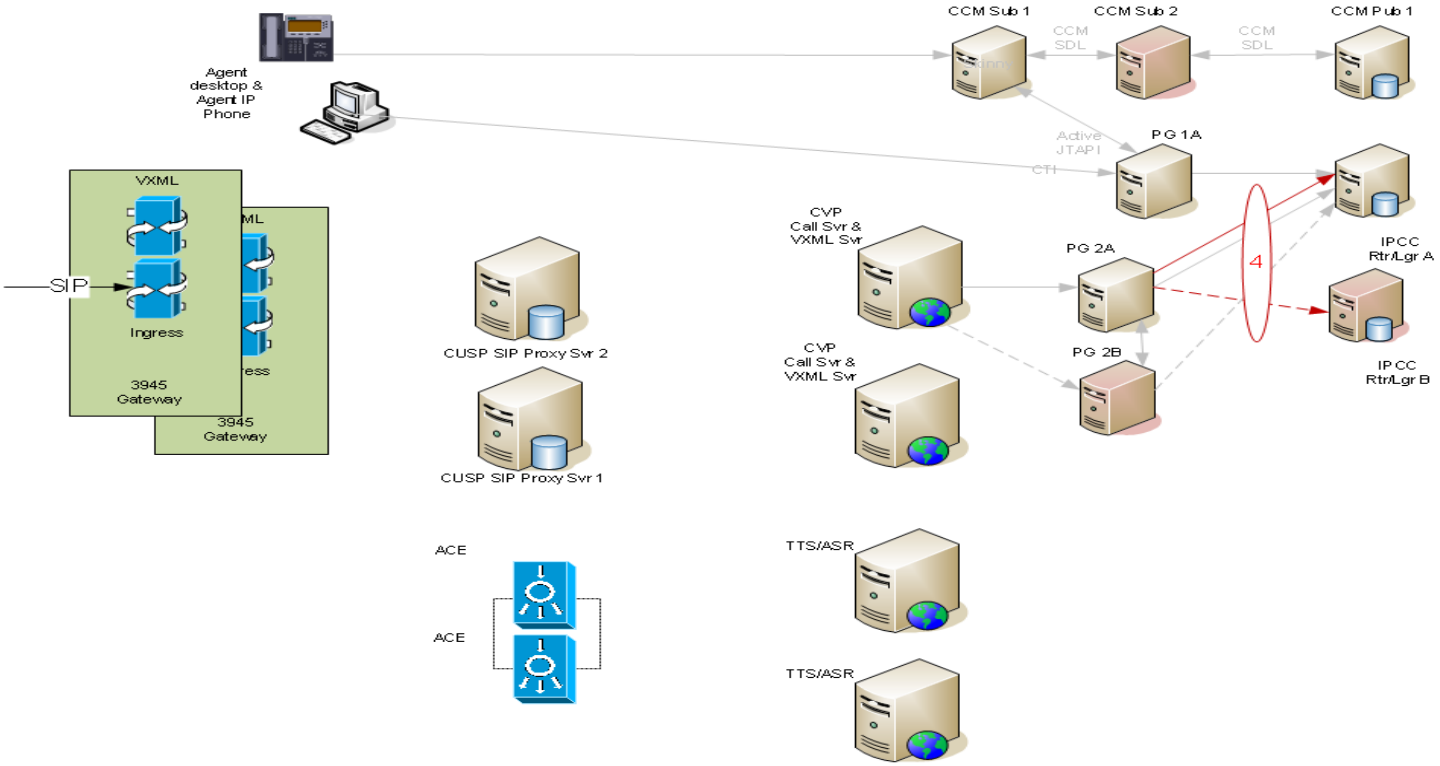
Call Flow – Contacting the Available CVP Server



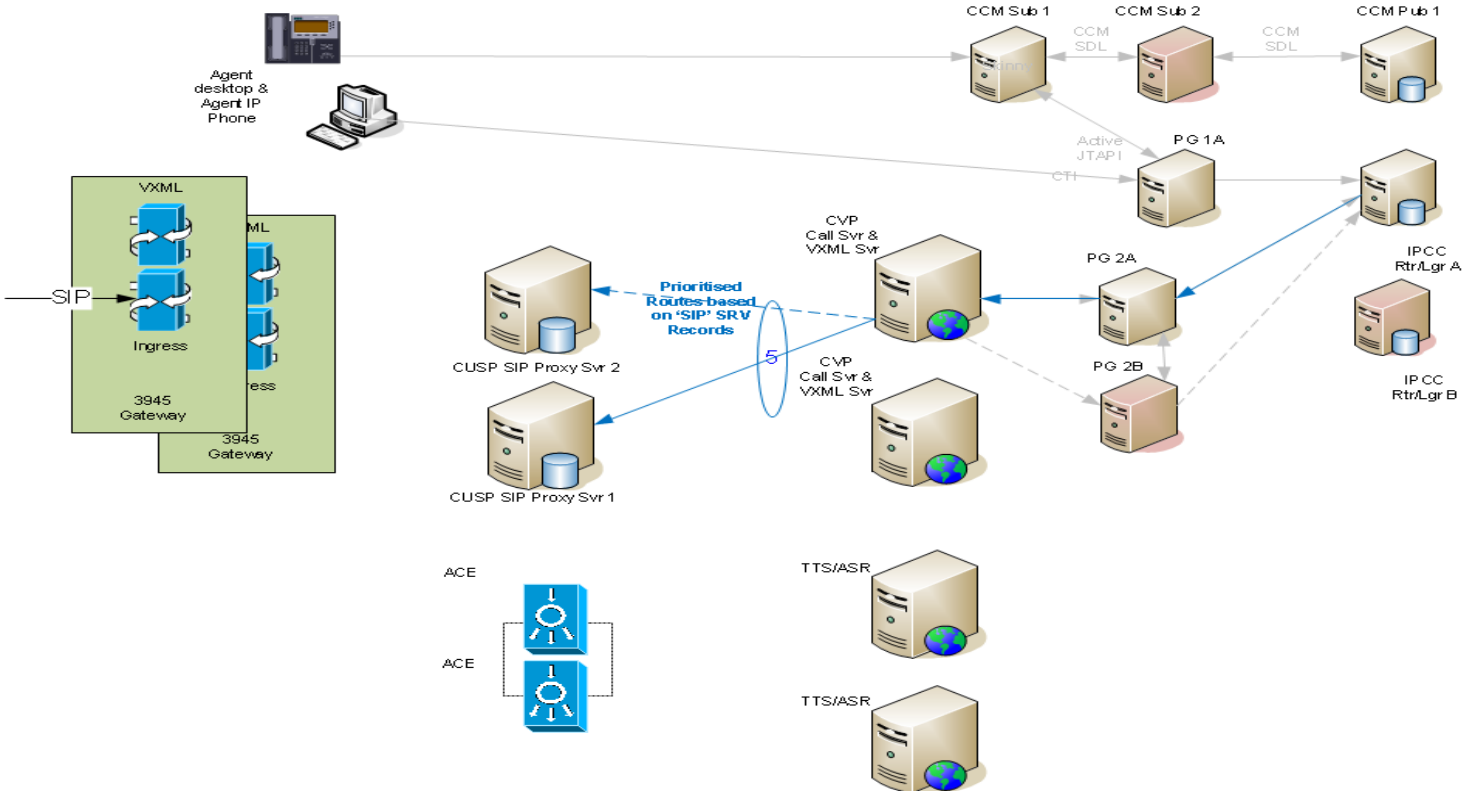
Call Flow – Finding an Available Routing pim



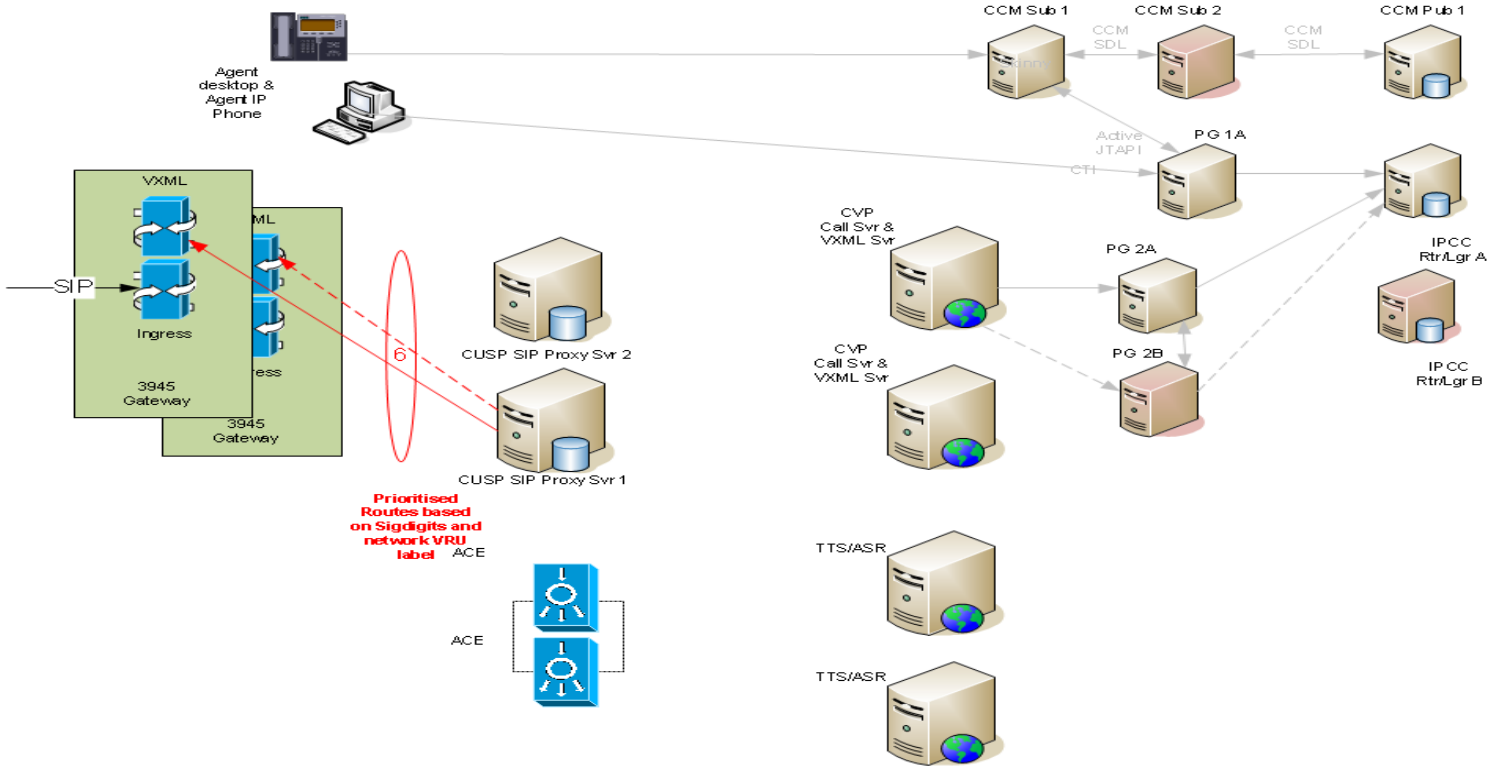
Call Flow- Contacting the Available Router



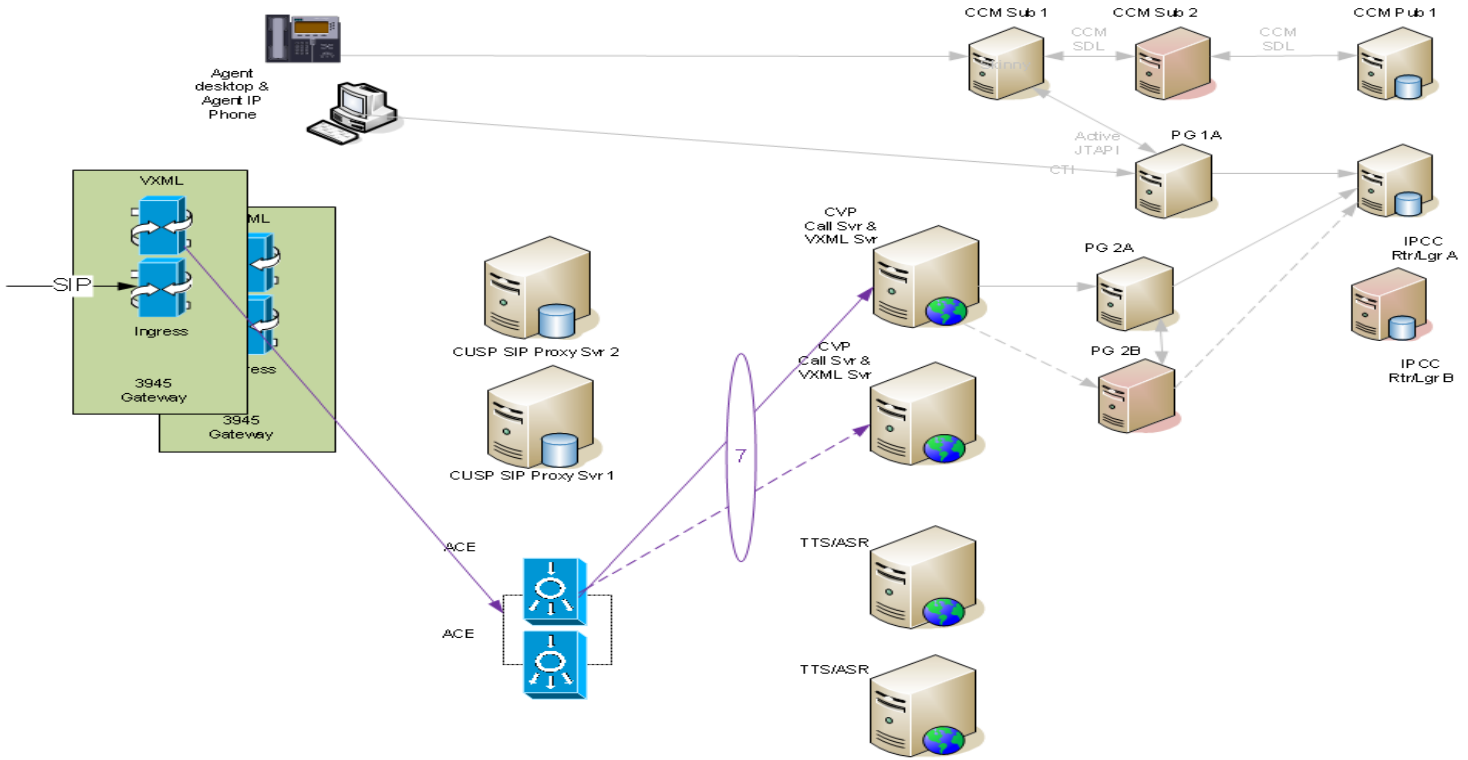
Call Flow – Finding an Available VRU Leg



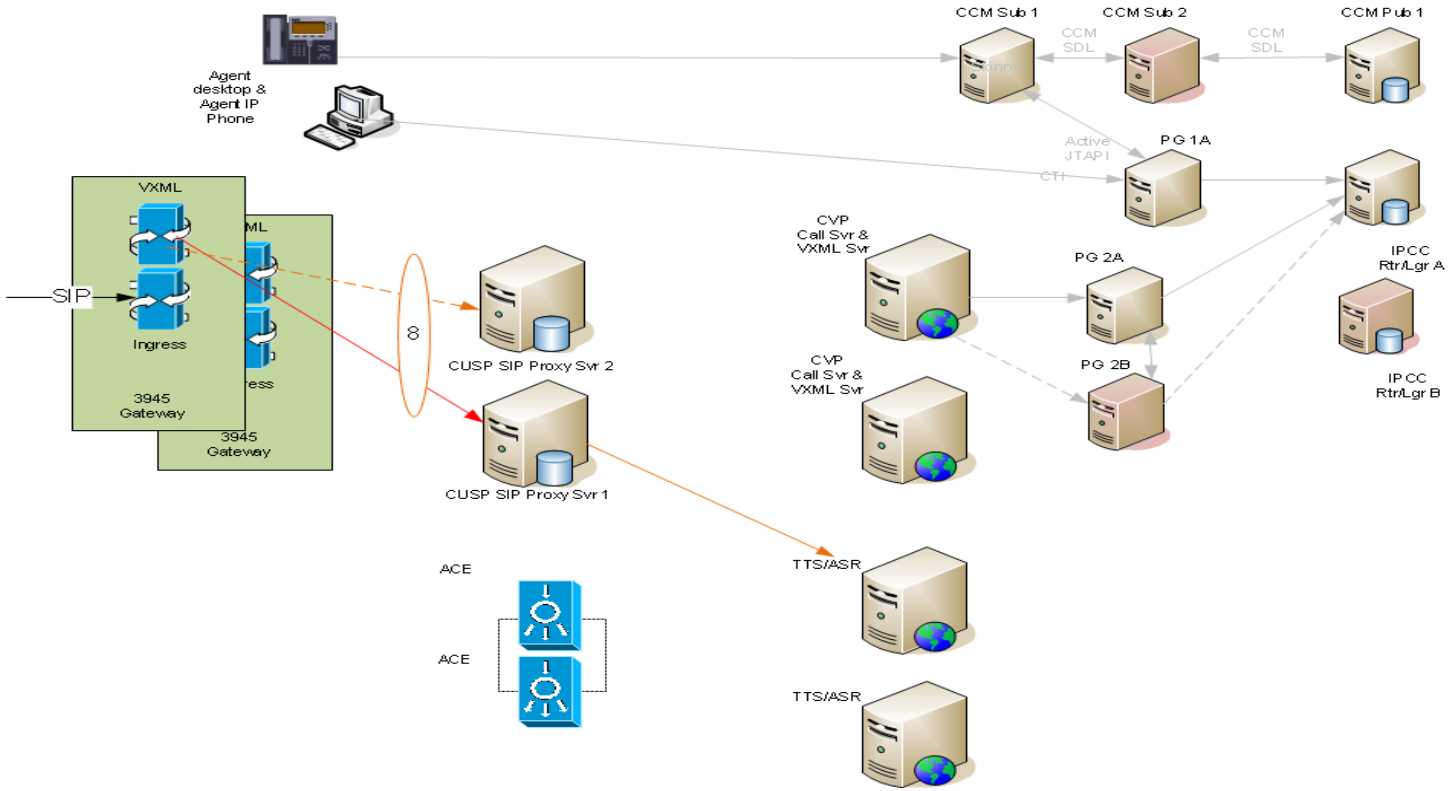
Call Flow – Contacting the VRU Leg



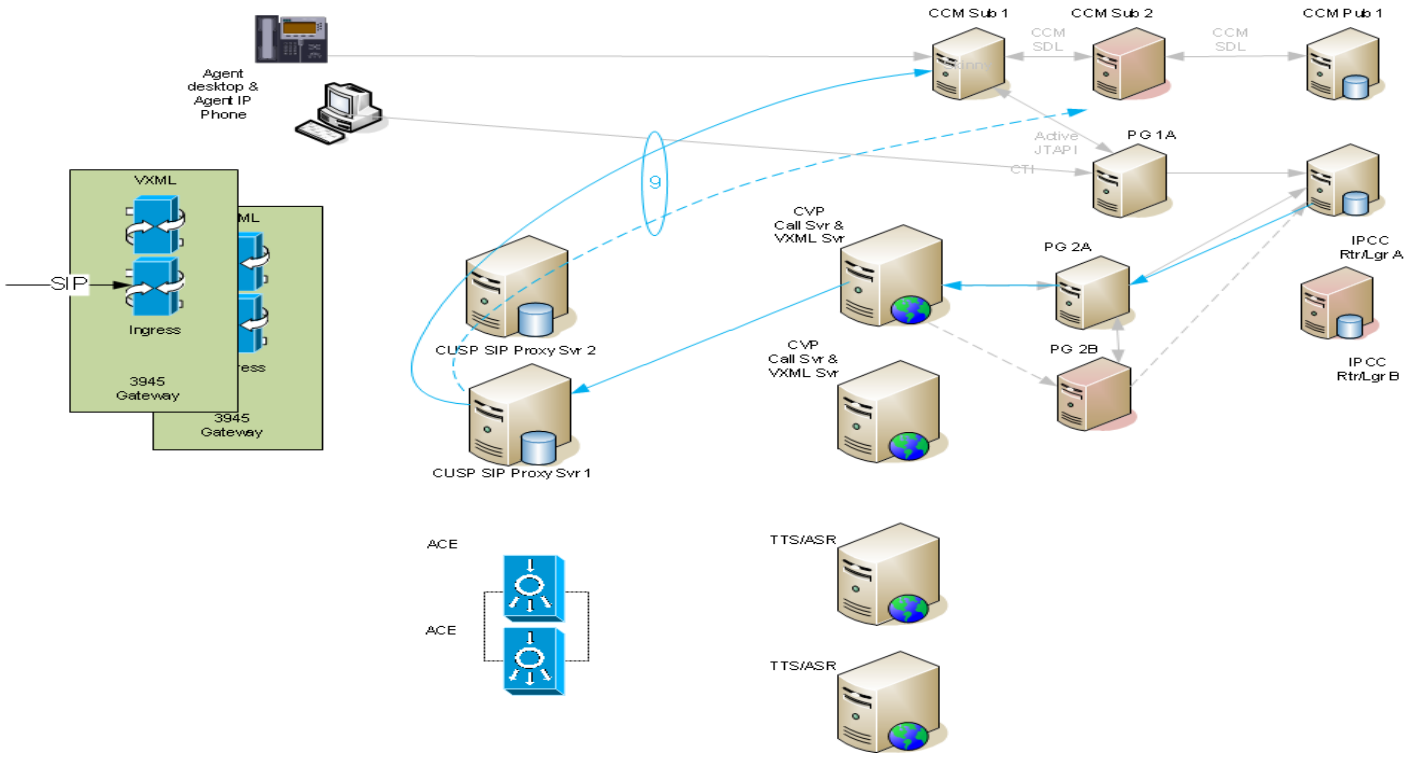
Call Flow – Finding an Available VXML Server



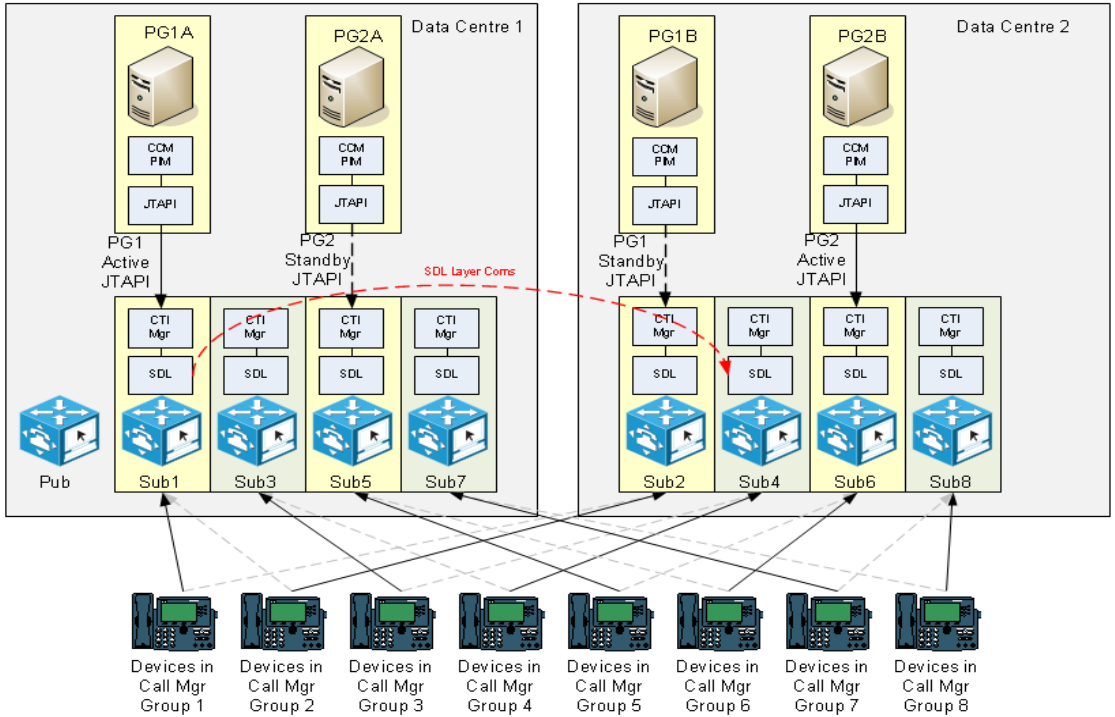
Call Flow – Finding an Available TTS/ASR



Call Flow – Finding an Available CallManager Subscriber

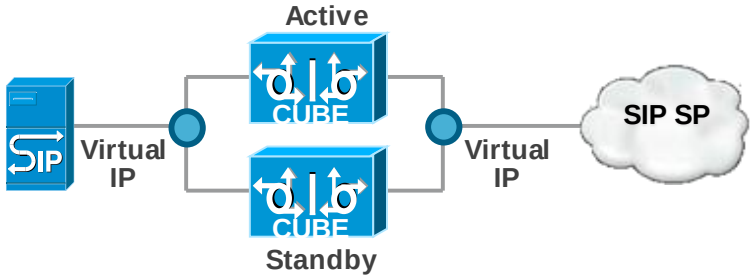


CUCM Redundancy

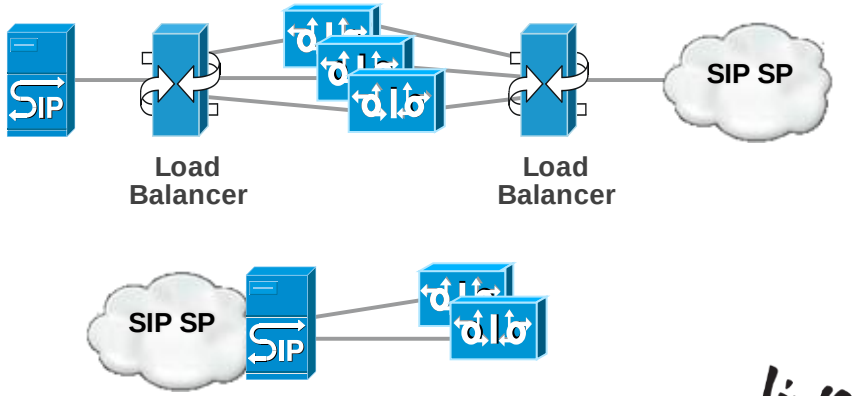


CUBE Local Redundancy

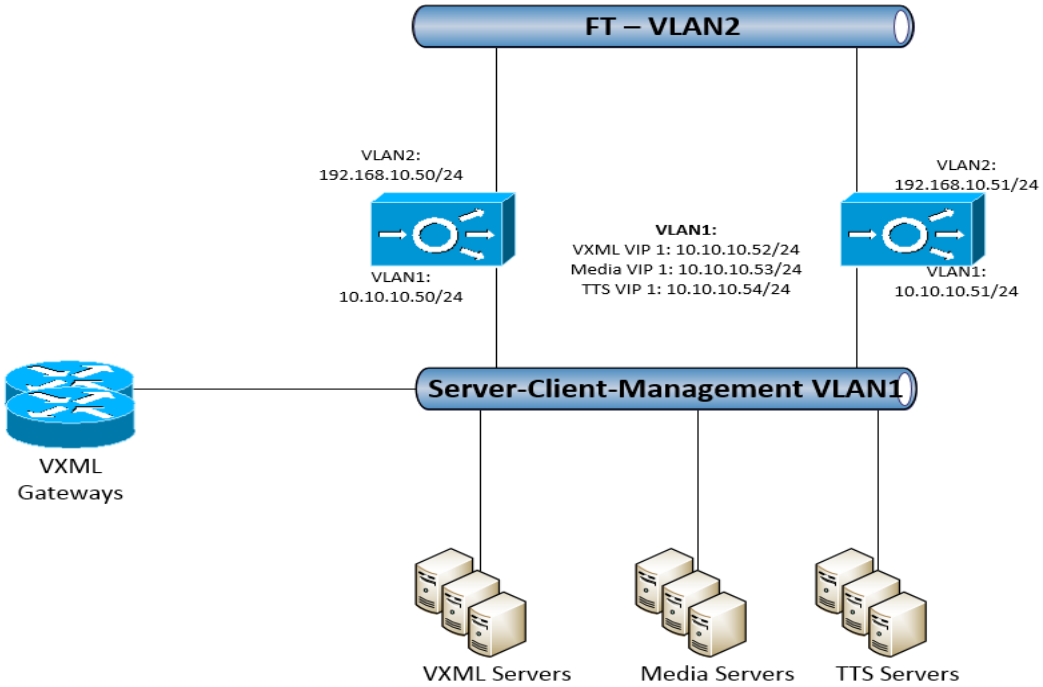
- **L2 Box-to-Box redundancy**
  - ISR G2 (Stateful failover)
  - SIP SP sees one VIP address



- **Clustering with load balancing**
  - All platforms
  - Load balancing by
    - SP call agent
    - SIP proxy/load balancer
  - Local and geographical redundancy



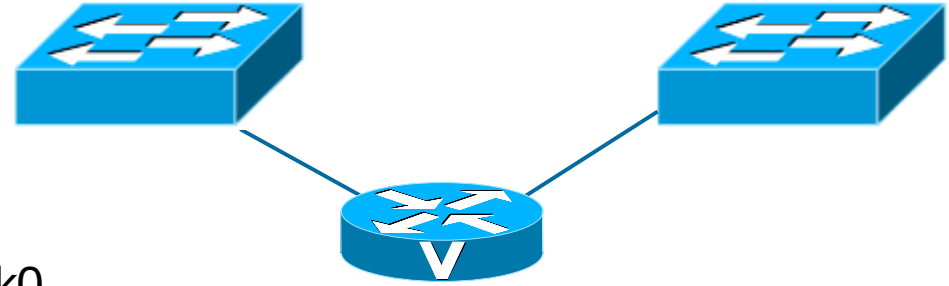
ACE Local Redundancy



Network Equipment Redundancy - Loopback

Requirement: Network equipment to be dual attached to redundant upstream infrastructure.

Use Loopback as the central point



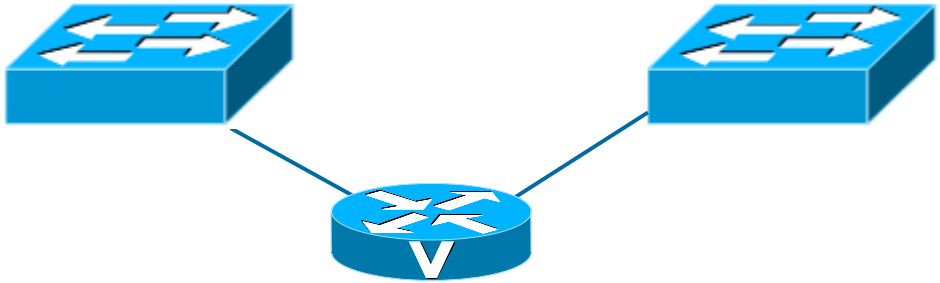
voice service VoIP
sip
bind control source-interface Loopback0
bind media source-interface Loopback0

The IP routers for the network must provide redundant routes to this loopback interface and correctly propagate those routes to the rest of the routers in both data centres.

Network Equipment Redundancy – Port Channel

```
interface Port-channel1
 ip address X.X.X.X 255.255.255.252
!
interface GigabitEthernet0/0
 no ip address
 duplex auto
 speed auto
 channel-group 1
!
interface GigabitEthernet0/1
 no ip address
 duplex auto
 speed auto
 channel-group 1
```

Provide a port channel to VSS or VPC.

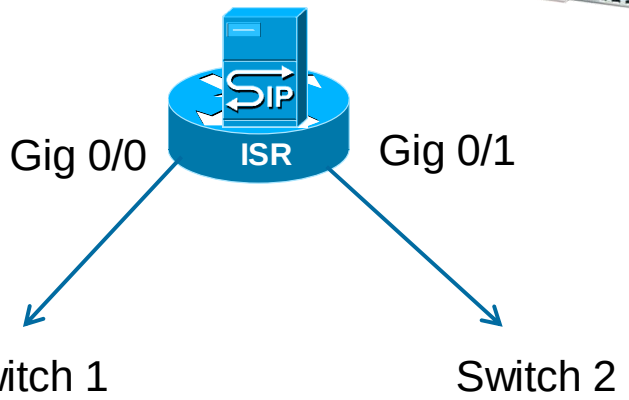


CUSP Local Redundancy

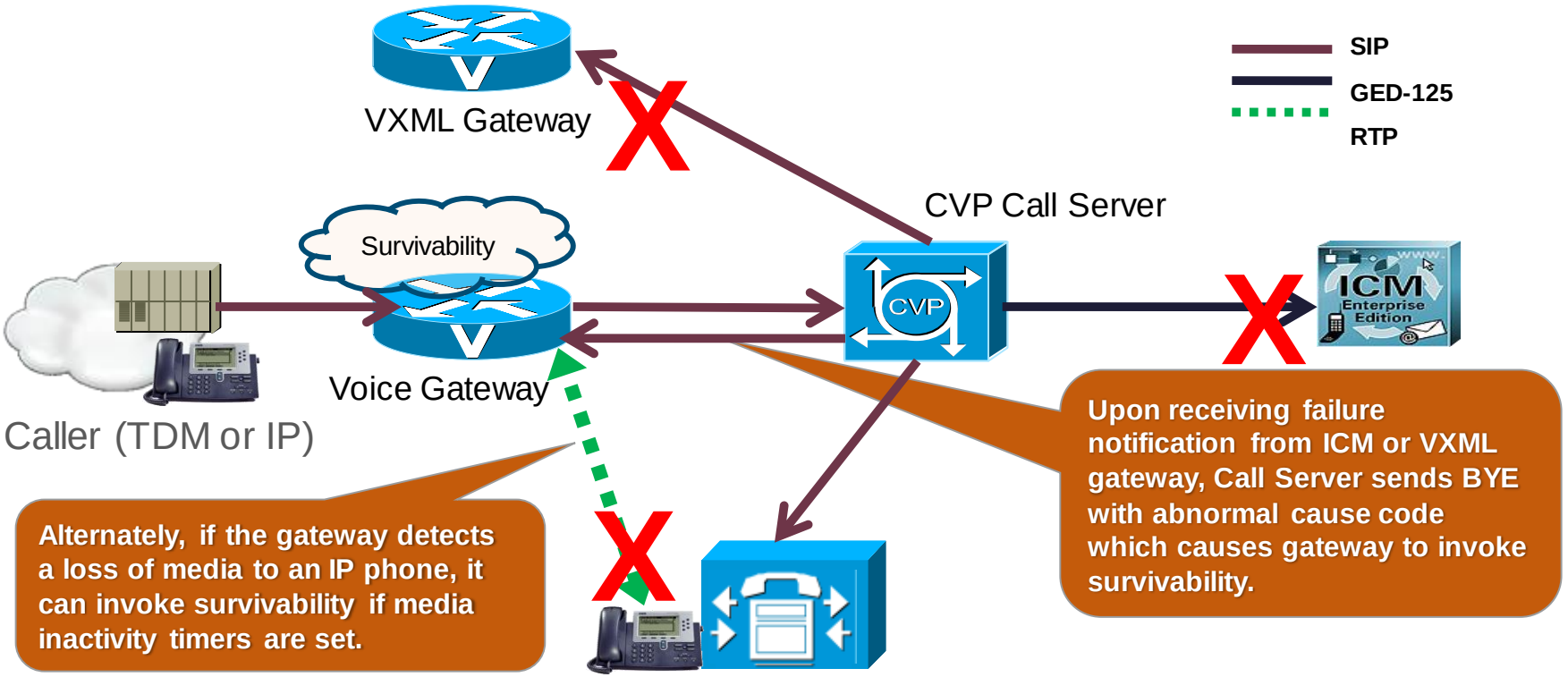
```
interface Port-channel1
 ip address 10.22.1.187 255.255.255.248

interface GigabitEthernet0/0
 channel-group  1
interface GigabitEthernet0/1
  channel-group  1

interface SM1/0
 ip unnumbered  GigabitEthernet0/1
 service-module ip address 10.22.1.188
255.255.255.248
 !Application: Cisco Unified SIP Proxy running on
SME
 service-module ip default-gateway 10.22.1.185
```

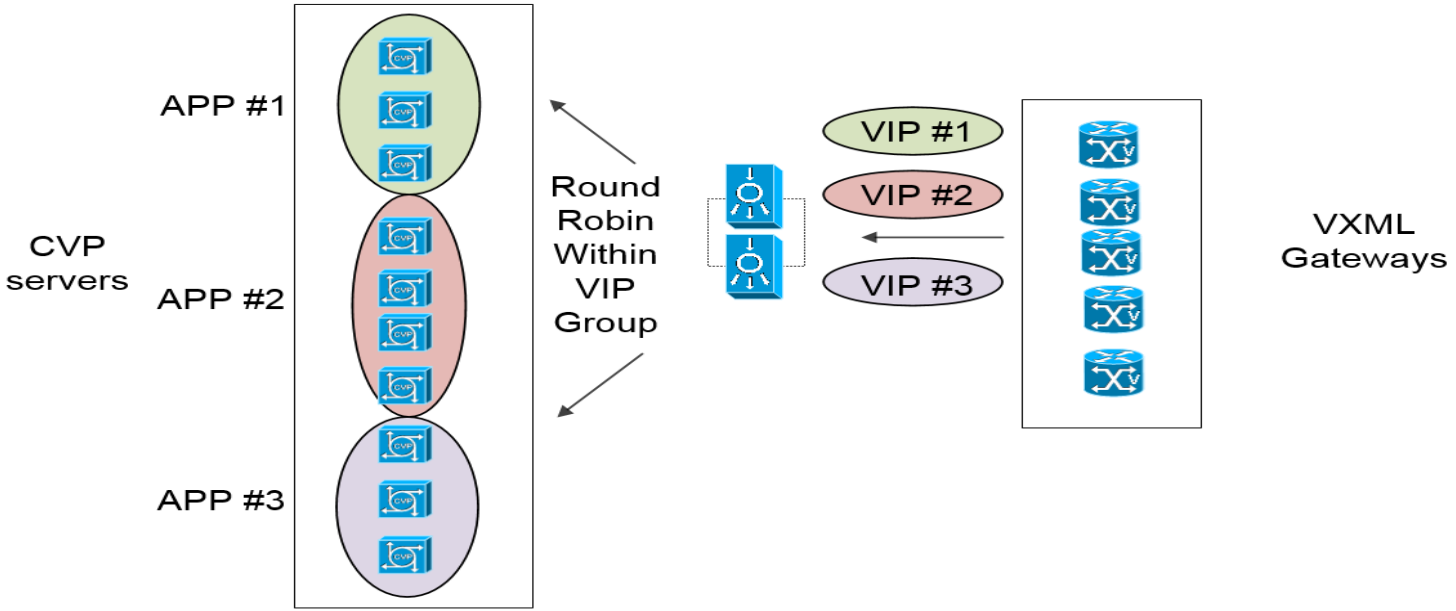


CVP Survivability



Application Redundancy

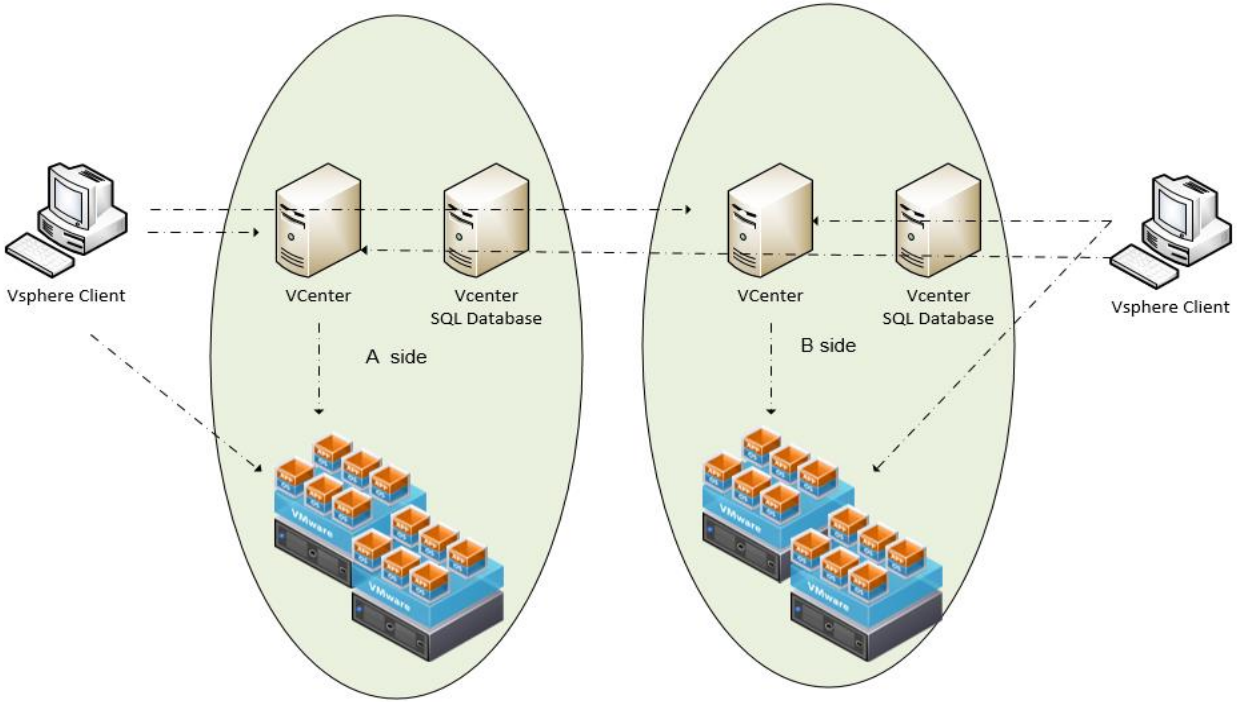
Spread applications across CVP servers.



Design - Virtualisation

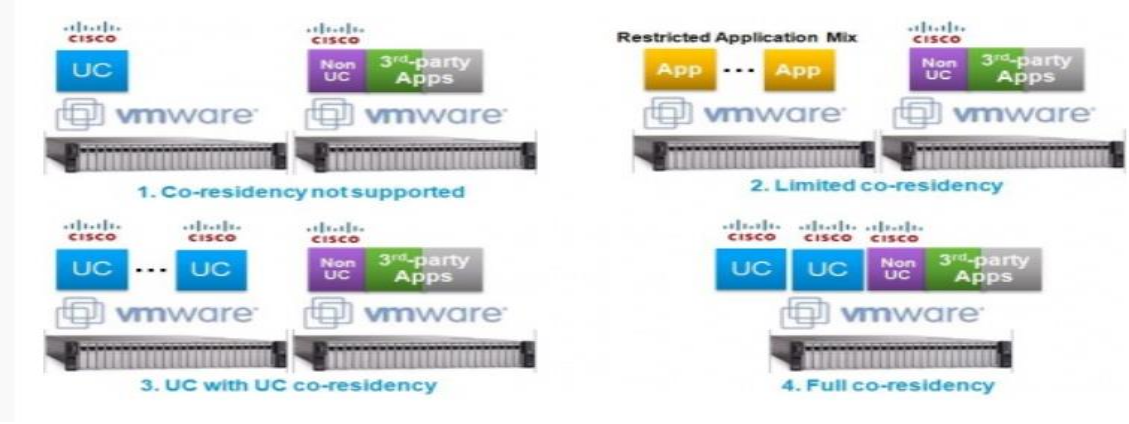
Cisco live!

VMware Architecture



Unified CCE Component VM Co-residency

Version	Co-residency Policy
10.x	Full
8.0(2+) - 9.0(x)	UC on UC only



Version 9.x and 10.x

Could we put an Exony VM on the same blade that has a VRU PG VM deployed?

Virtual Machine Layout and Placement Logic

UCS-C240M3S Chassis			
ESXi Server	Component	#vCPU	RAM (GB)
ESXi Server A-1	Router A	4	8
	Domain Controller A	2	4
	Agent PG 1A (CTIOS, MR PG, SIP Dialer)	2	6
	UCM_1 Subscriber-1	2	6
	CVP Call+VXML Srv 1	4	4
	UCM_1 TFTP-1	2	6

Place the primary and secondary call processing subscribers on separate servers, chassis or sites

PG1A not on the same server as PG2A

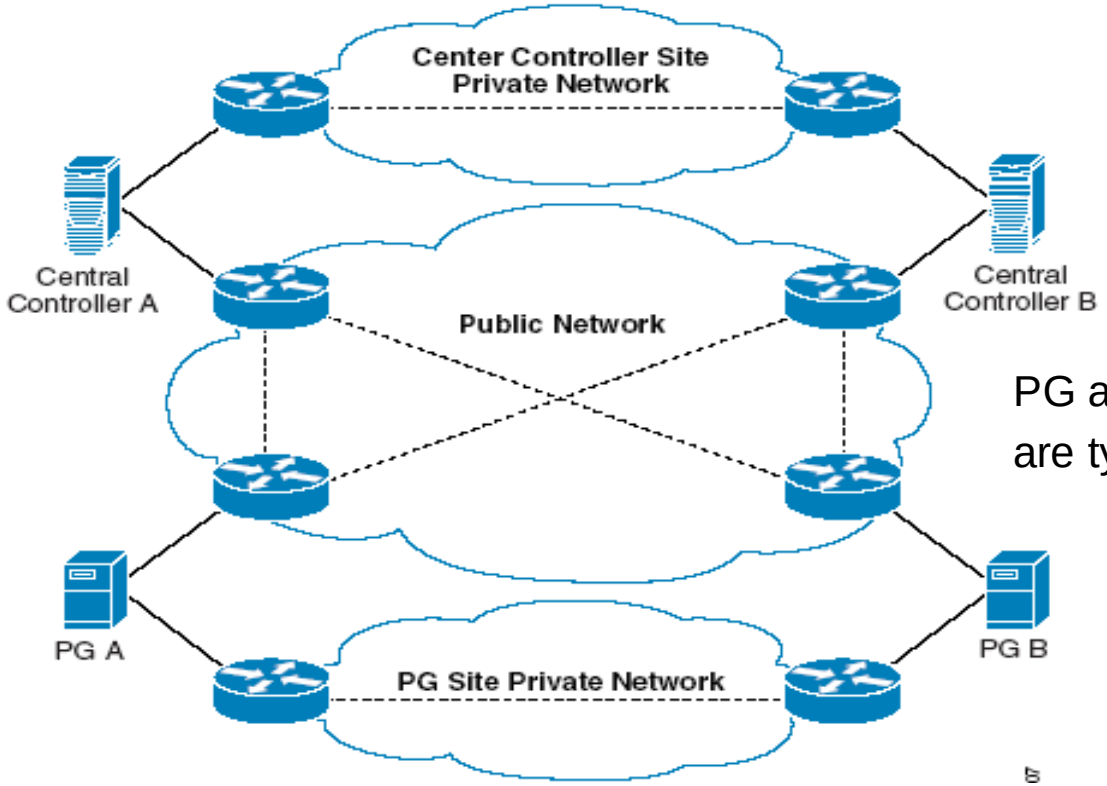
UCS-C240M3S Chassis			
ESXi Server	Component	#vCPU	RAM (GB)
ESXi Server B-1	Router B	4	8
	Domain Controller B	2	4
	Agent PG 1B (CTIOS, MR PG, SIP Dialer)	2	6
	UCM_1 Subscriber-2	2	6
	CVP Call+VXML Srv 2	4	4
	UCM_1 TFTP-2	2	6

ESXi Server A-2	Logger A	4	8
	Agent PG 2A (CTIOS, MR PG, SIP Dialer)	2	6
	UCM_2 Subscriber-1	2	6
	CVP Call+VXML Srv 3	4	4

ESXi Server B-2	Logger B	4	8
	Agent PG 2B (CTIOS, MR PG, SIP Dialer)	2	6
	UCM_2 Subscriber-2	2	6
	CVP Call+VXML Srv 4	4	4

Design - Network

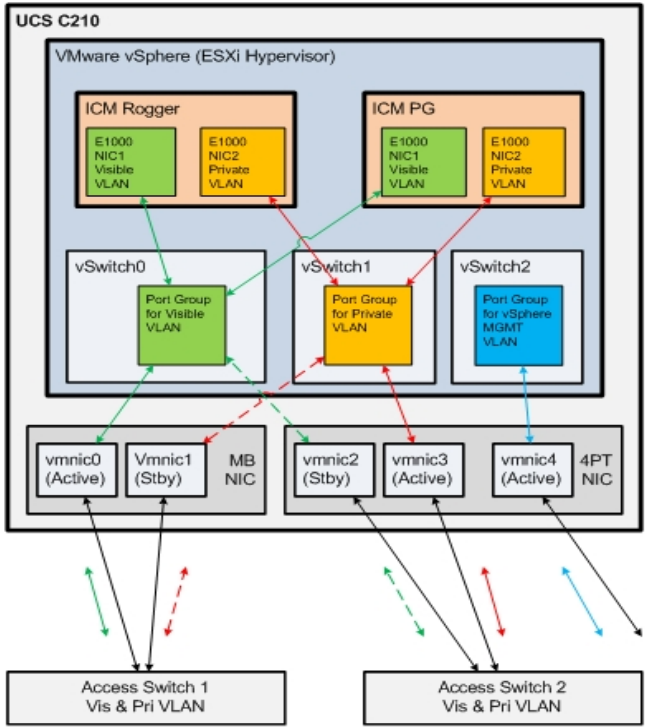
Network - Private and Public



PG and CC private links are typically one physical link

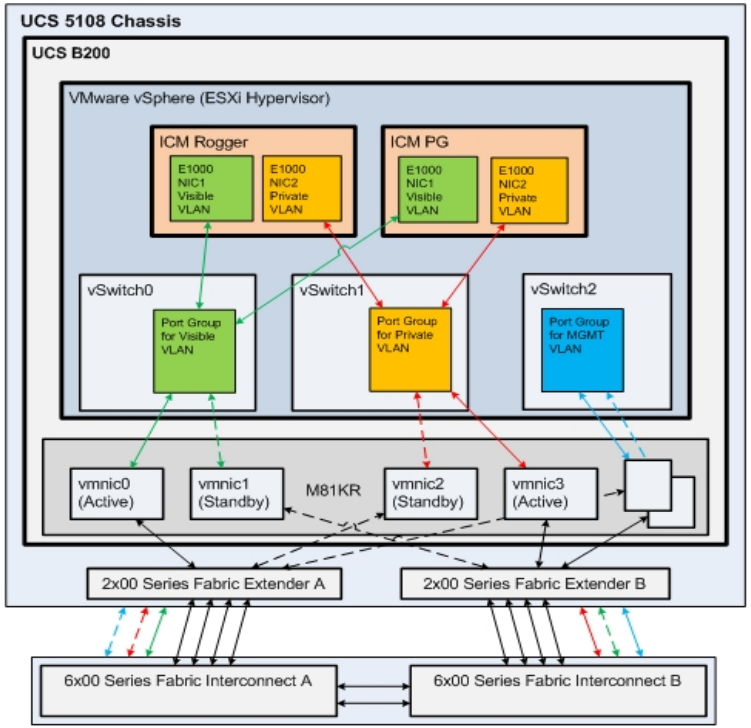
UCCE VMware Private and Public Network Topology

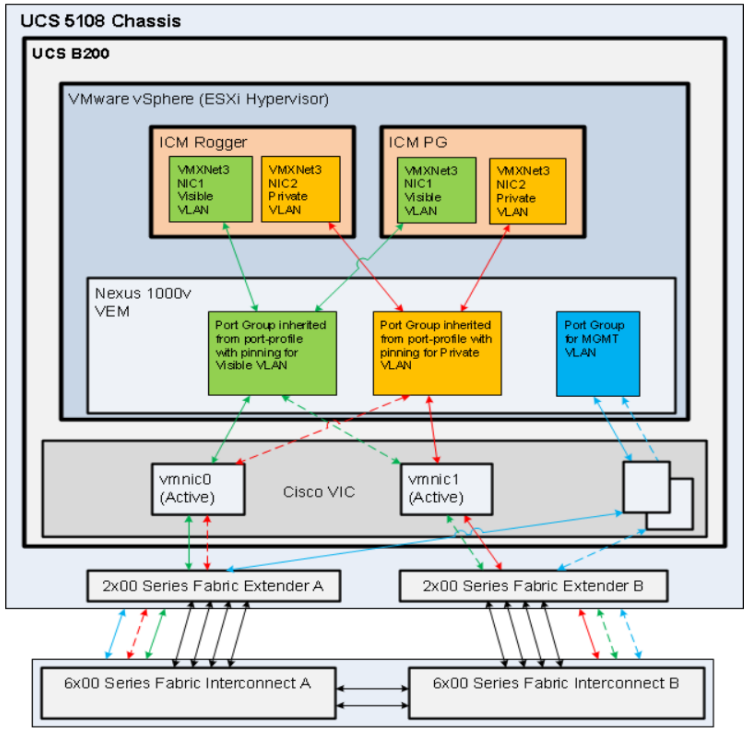
C series



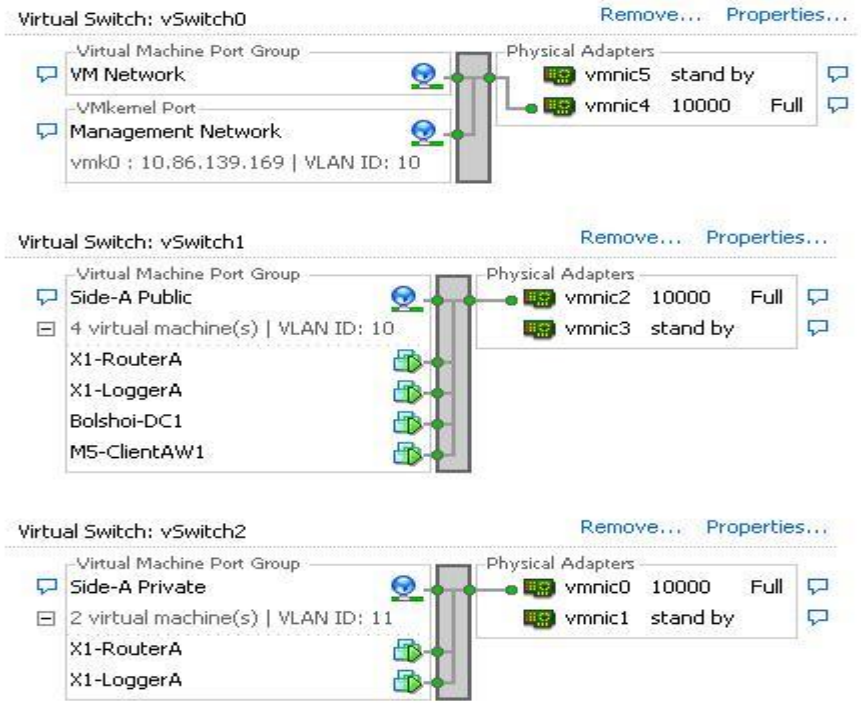
UCCE VMware Private and Public Network Topology

B series



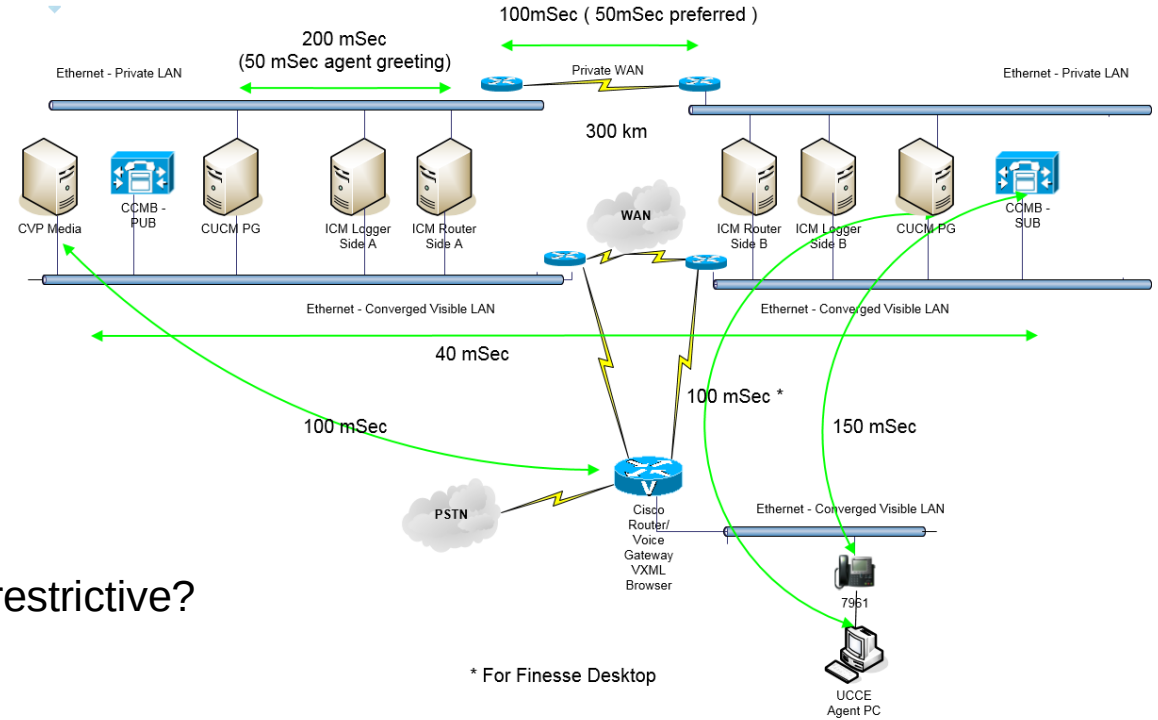


VMware Network



Network - Latency

One way latency requirements



What is the most restrictive?

Private Link

Component	Effective BHCA	Multiplication Factor	Recom- mended Link (bps)	Multiplic ation Factor	Recommend ed Queue (bps)	
Router + Logger	120,000.00	* 30	3,600,000.00	* 0.8	**2,880,000.00**	**Total Router + Logger High-Priority Queue Size**
Unified CM PG	120000	* 100	12,000,000.00	* 0.9	10,800,000.00	Add these numbers together and put the total in the shaded box below to get the PG High-Priority
Unified IP IVR PG	N/A	* 60		* 0.9		
Unified CVP PG	160800	* 120	19,296,000.00	* 0.9	17,366,400.00	
Unified IP IVR or Unified CVP Variables	160800	* ((Number of Variables * Average Variable Length) / 40)	3,216,000.00	* 0.9	2,894,400.00	
		Total Link Size	**38,112,000.00**		**33,940,800.00**	**Total PG High-Priority Queue Size**

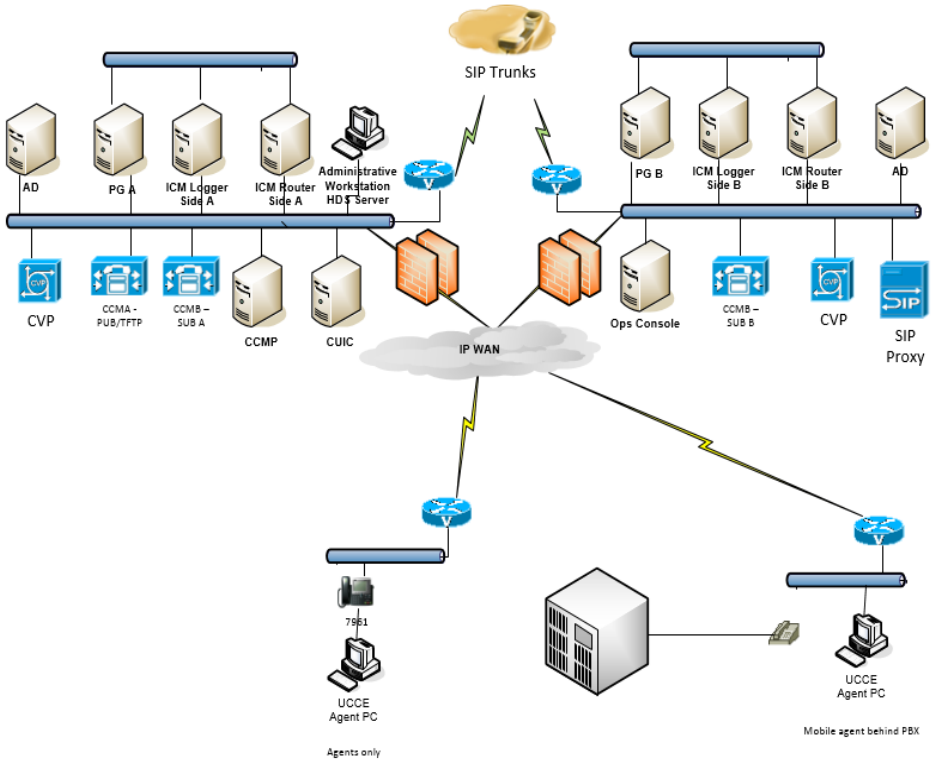
Public Link Bandwidth

Component	Comment	Tool
VRU PG	Communicates with the CC possibly over the WAN	http://www.cisco.com/c/en/us/support/customer-collaboration/unified-contact-center-enterprise/products-implementation-design-guides-list.html
Agent PG	Communicates with the CC possibly over the WAN	http://www.cisco.com/c/en/us/support/customer-collaboration/unified-contact-center-enterprise/products-implementation-design-guides-list.html
CTI Server to CTIOS	Communicates possibly over the WAN	UCCE SRND
CTIOS Server to Agent	Communicates is over the site WAN	http://www.cisco.com/c/en/us/support/customer-collaboration/computer-telephony-integration-option/products-technical-reference-list.html
Finesse Server to Agent Finesse Server to CTI Server	Most expensive is Agent login	http://www.cisco.com/c/en/us/support/customer-collaboration/finesse/products-technical-reference-list.html

Public Link Bandwidth - continued

Component	Comment	Tool
CVP SIP Signalling	For Branch models communicates is over the site WAN	CVP SRND
CCMP	Communicates over the WAN for quad deployment	UCCE SRND
ICCS/Database/CTI	Communicates over the WAN	CUCM SRND
RTP	Overflow between UCCE systems using ICM to ICM gateway	CUCM SRND See VoIP Bandwidth Reference Slide
Sip Signalling	between UCCE systems using ICM to ICM gateway	CUCM SRND
VXML Documents	For Branch models communicates is over the site WAN	CVP SRND
Media Files	For Branch models communicates is over the site WAN	CVP SRND

Firewalls – Where are they?



Since users are the main threat suggest

- IP ACL's from DC subnet to DC subnet
- Port ACL's from the site to DC

See

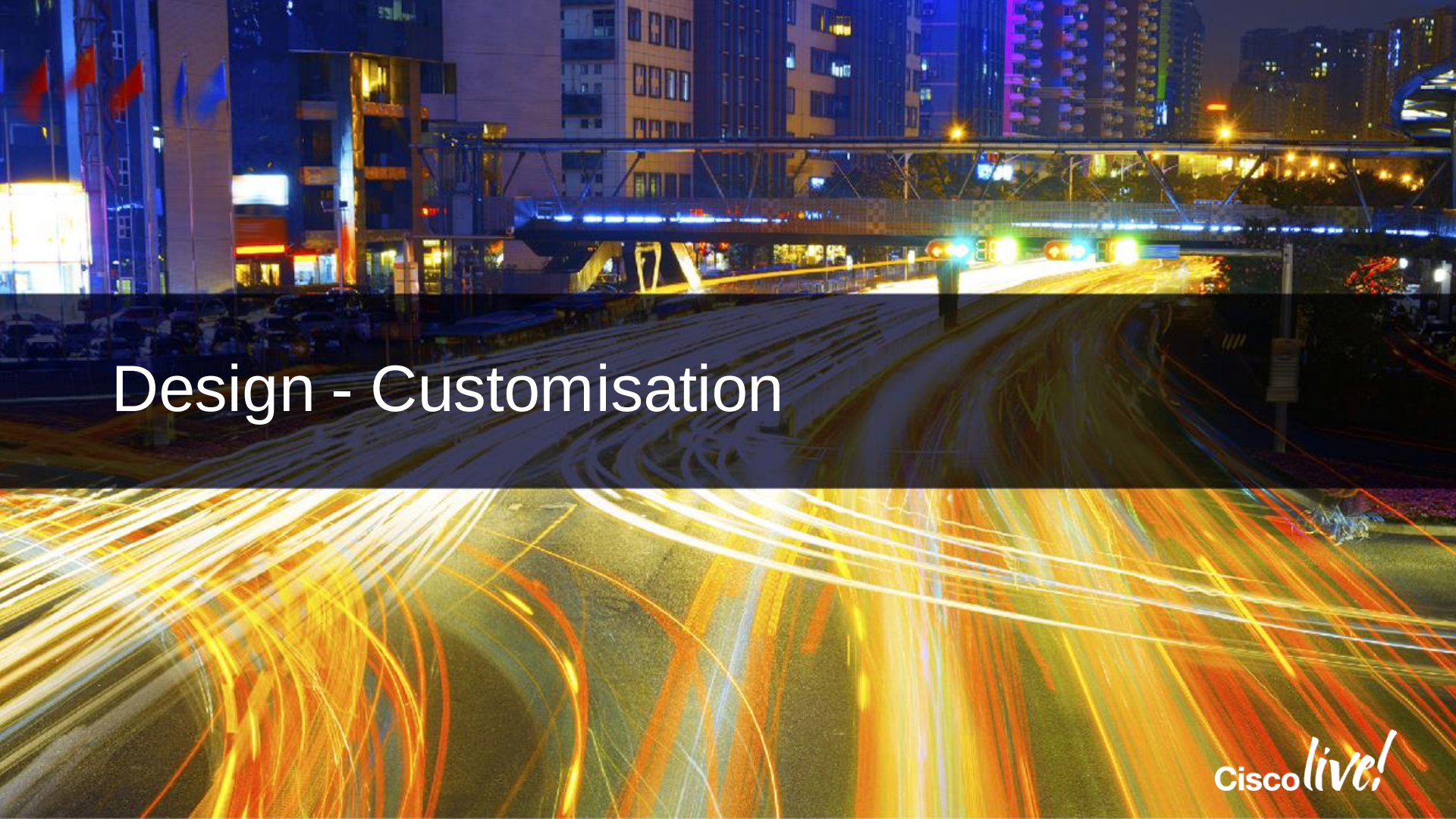
- Securing Cisco Unified Contact Centre Enterprise
- Cisco Unified CVP port utilisation

- Operations console uses dynamic ports

Fill out host template for deployment

- Watch length of hostnames - maximum length is 15 in windows 2008
- Avoid Special characters
- Use of hostnames in setup allows for future changes in ip address's.
- Use of hosts file to reduce need for DNS
- Ensure nslookup and ping of names match

Server		Host Name	NIC Information	
7	UCCE (RouterA & LoggerA)	RGRA (Visible) GEOCISCORTRA	IP Add	X.X.X.X
			Mask	X.X.X.X
			DR/GW	X.X.X.X
			DNS1	X.X.X.X
			DNS2	X.X.X.X
			WINS1	X.X.X.X
			WINS2	X.X.X.X
		RGRA-h (Visible, High) GEOCISCORTRAH	IP Add	X.X.X.X
			Mask	X.X.X.X
		RGRA-p (Private) GEOCISCORTRAP	IP Add	X.X.X.X
			Mask	X.X.X.X
		RGRA-ph (Private, High) GEOCISCORTRAPH	IP Add	X.X.X.X
			Mask	X.X.X.X



Design - Customisation

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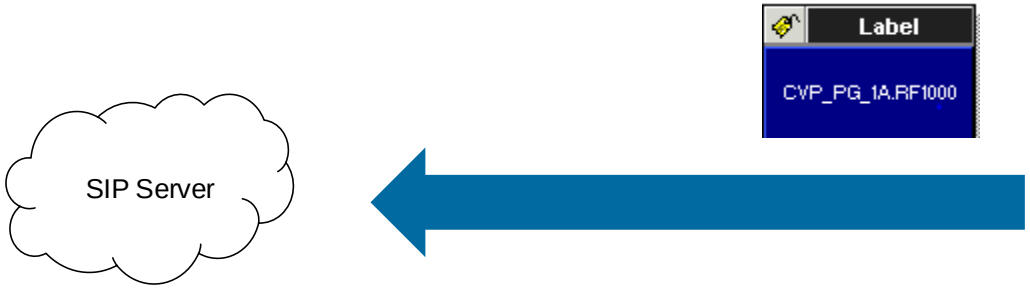
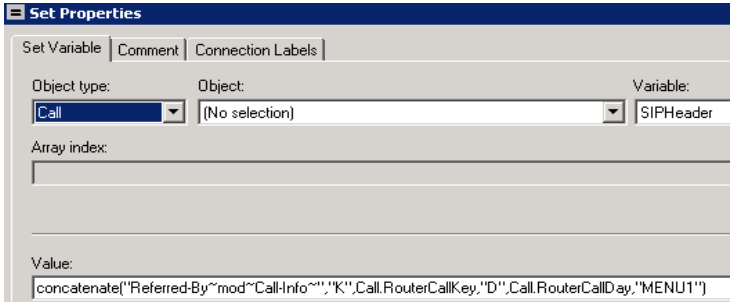
Customisation Design

Integration with External SIP Server

Passing of Headers from ICM script allows sending information to the SIP server






```
Referred-By: <sip:CVP@10.67.59.14:5060>;call-info=K203D150809MENU1
```

he model is like this:
header_name~mod~parameter_name~new_value

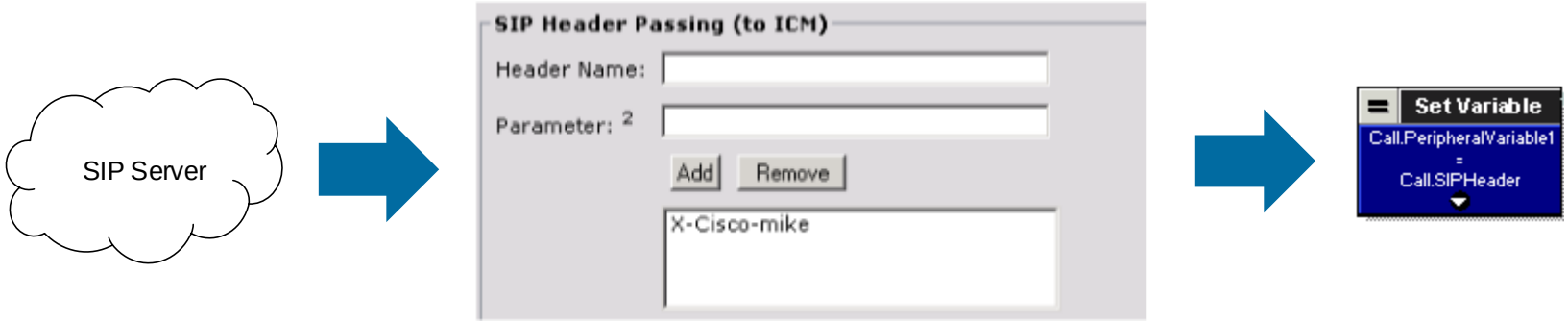
Maximum is 200 characters

Why do you think the RouterCallKey and RouterCallDay is a good idea to pass to the SIP server?

Customisation Design

Integration with external SIP server

Passing information in SIP headers to ICM allows getting information from the SIP Server



Design – Reporting

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Sources for Reporting

- CUIC Stock Reports
  Cisco Unified Contact Center Enterprise Reporting User Guide 10.5(1)

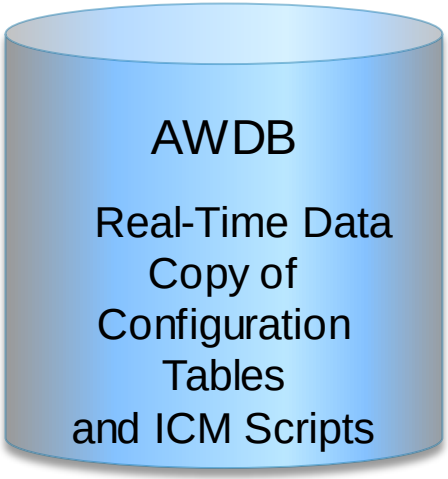
- Reports from the forum
  http://developer.cisco.com/web/ccr/documentation

- CUIC Custom Stock Reports

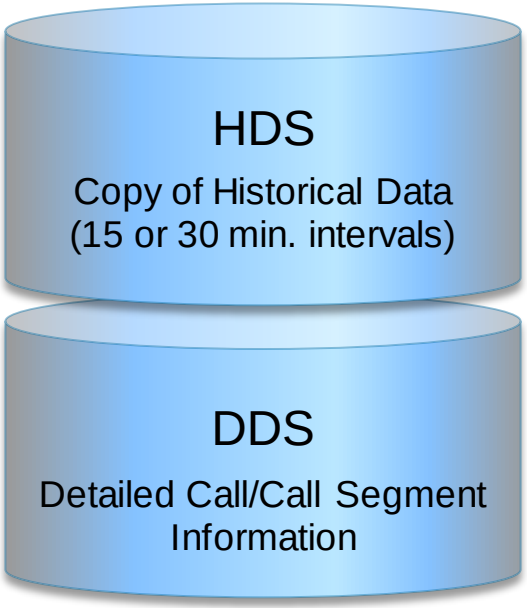
- Third Party reporting System – Exony

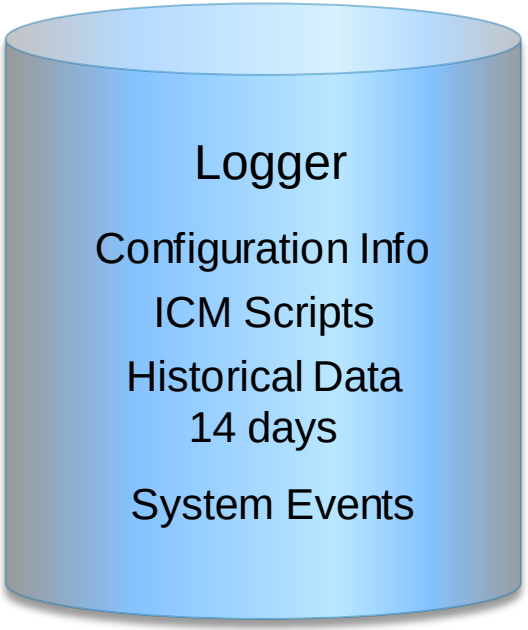
- Build your own reporting system

Database Sources for Reporting



Administration &
Data Server



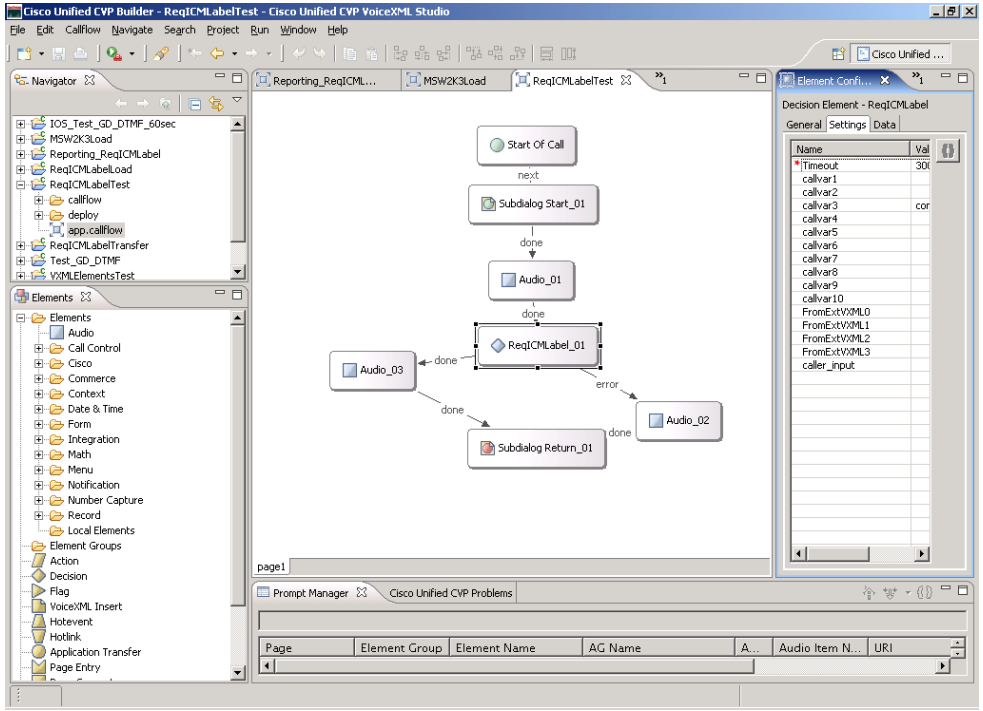


Do not go here

* Located at each side

Database Sources for CVP Reporting

Requirement: Need to know menu usage

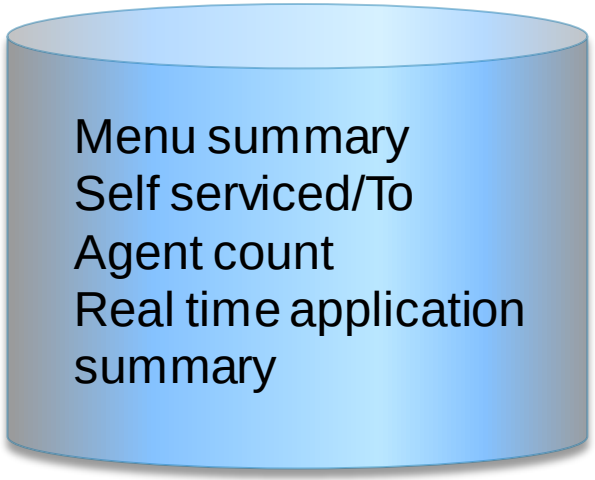


* Records cut at end of call
* Each CVP server will point to one CVP reporting server

Custom Database for Reporting

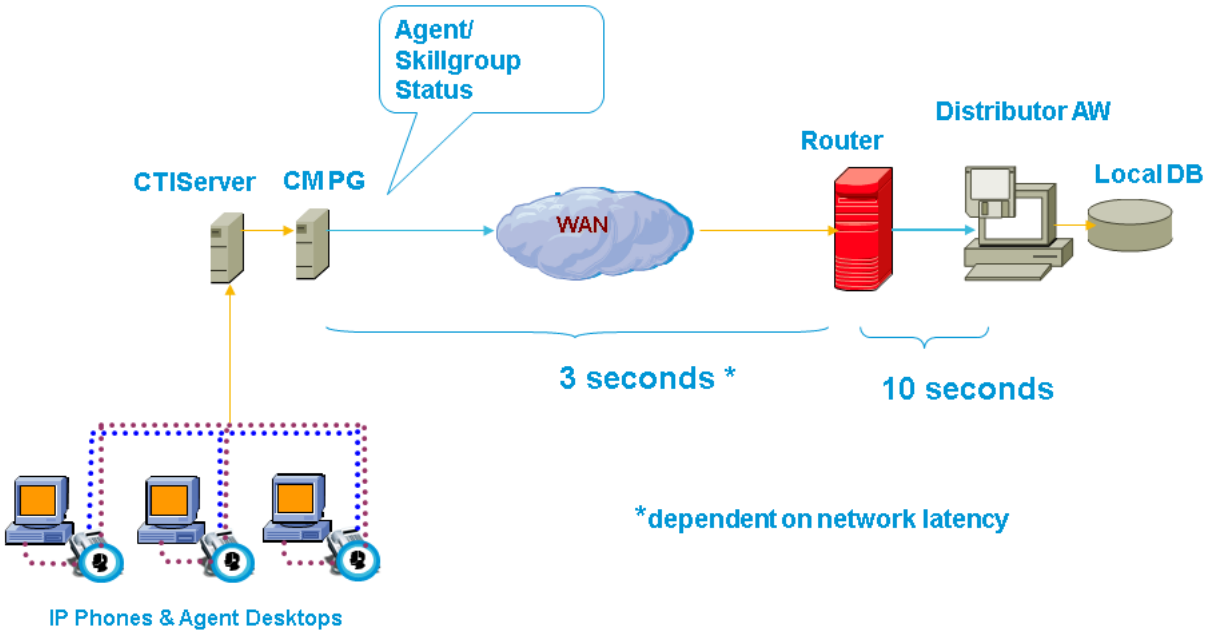
Session variables in VXML Application written to DB at start of application

Session variables in VXML Application written to DB at end of application



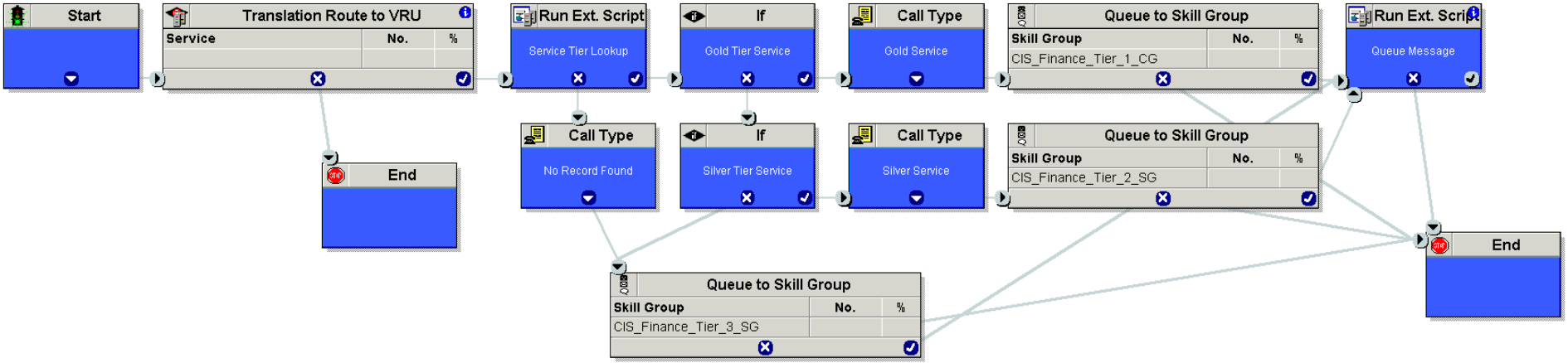
Custom DB Server

Real Time



Mapping to Significant Business Metrics

Requirement: Need to know the SLA and count of Gold versus Silver customer calls



Design: Use calltypes to get the metrics required

Design - lab

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LAB

The uses of a lab:

- Development
- Regression testing of patches
- New functionality testing
- Upgrade testing

What model to use:

- Exact duplicate of production
- Exact duplicate of production with virtual machines compressed by ½
- Exact duplicate of production with no redundancy and virtual machines compressed by ½

Design – Dial Plan

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CUCM Dial Plan Design

Extension Range From	Extension Range To	DID Range From	DID Range To	Usage	Comment
50000	59999			Agent Extension (Non DID)	
60000	69999	11120000	11120099	Agent DID Line	
70000	79999			Agent Extension (Non DID)	To CUCM Cluster2
80000	80099			Route Points	For IP Phone transfers
82000	82099			Hunt Groups	
83000	83099			Call Park	
84000	84099			Voicemail	
97780	NA			UCCE CVP VRU Label	
0				0 to get an outside line	

Dial Plan Service Design

PSTN Number Mapping

1800/1300 Number	Dialed Number	Dialed Number Presented to GW	Purpose
1300 803 5151	0311110000	111110000	Sales
1300 555 1234	0311110001	111110001	Service

Gateway #1 Number Mapping

Dialed Number Range From	DID Number Range To	DN Mapping Range From	DN Mapping Range To	Usage
111110000	111110099	901**40000**	901**40099**	UCCE Pilot DNIS

Dial Plan DID Design – Contiguous Numbers

PSTN Number Mapping

DID Number	Dialed Number Presented to GW
0311116000	111160000

Gateway #1 Number Mapping

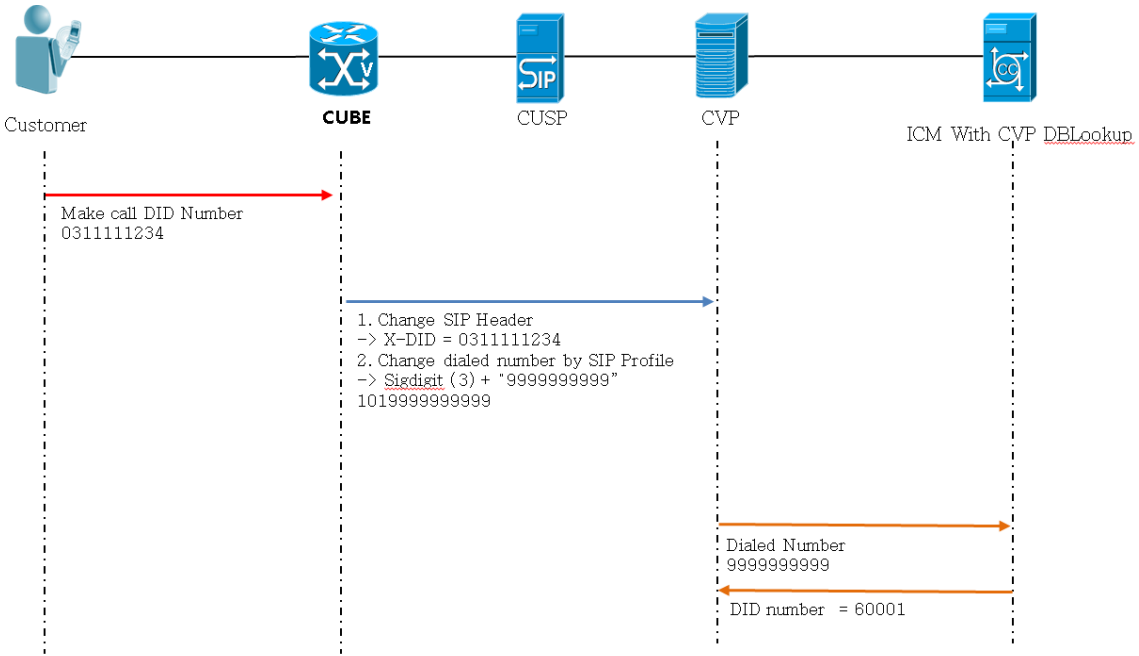
DID Range From	DID Range To	DN Mapping Range From	DN Mapping Range To	Usage
111160000	111160099	613111160000	613111160099	DID Numbers

CUCM Translation

Translation Pattern	Called Party Transformations
6131111.60000	PreDot

Dial Plan DID Design – non-contiguous numbers

DID Number	Agent DID
0311116000	60000
0311111234	60001



UCCE Dialled Number Design

Dialed Number Range From	Dialed Number Range To	Usage	Comment
40000	40099	UCCE Pilot DNIS	See Dial Plan Service Design
80000	80099	UCCE Dialed Number Plan (DNP)	Used by CTIOS desktop for transfer to Skill Group capability

SIP CUSP Design

SIP Digits – each device is given a SIP Digit device identifier

CVP Gateway	SIP Digit
GW#1	901
GW#2	902
CUCM	909

SIP CUSP Dial Plan Design

SIP CUSP to GW

Number Range	Target Preference 1	Target Preference 2	Comments
90991919191 90992929292 90997780	GW#2	GW#1	CUCM originated Ringing Errors VRU Leg
90291919191 90292929292 90297780	GW#2	GW#1	GW2 originated Ringing Errors VRU Leg
90191919191 90192929292 90197780	GW#1	GW#2	GW1 originated Ringing Errors VRU Leg
0*	GW#1	GW#2	Outside call

SIP CUSP to CVP

Number Range	Target Preference 1	Target Preference 2
9014….	CVP1	CVP2
9024….	CVP2	CVP1
9094…	CVP1	CVP2

SIP CUSP to CUCM

Number Range	Target Preference 1	Target Preference 2
9015….	CUCM1	CUCM2
9025….	CUCM2	CUCM1

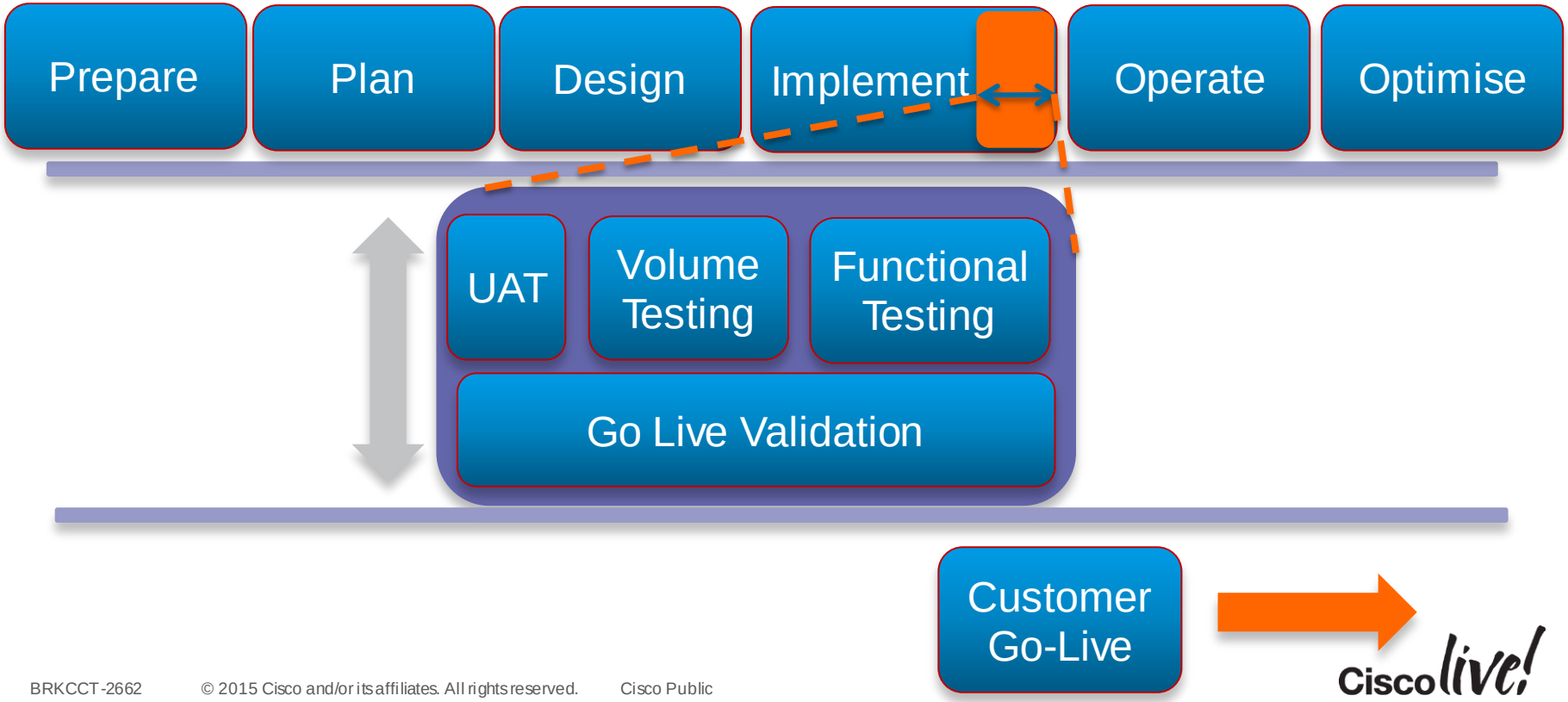

Backups

Backups

VM Backup Method	Backup Type	UCCE	UC applications
VMware Clone/Copy	Full – Application Consistent Backup with VM Power Off		Supported
Cisco DRS	Config Data Only Backup with VM running	NA but used by UCM / other UC apps in the UCCE solution	Supported
UCCE Config Data Export (ICMDBA, CVP Op Console Tool)	Config Data Only Backup with VM running		NA
UCCE 3rd party SQL Backup Tool	Database Backup Only; not entire VM and in maintenance windows/ low traffic hours only	Allowed with customer self-manage 	NA
VMware vDR/vDP or 3rd party VM Backup Tool (EMC Avamar, etc.) **w/o** backup agent	Full – Crash Consistent Backup with VM Running	Allowed & Guided support like UC Spec-based support policy (not guaranteed)	Allowed & Guided support like UC Spec-based support policy (not guaranteed)
3rd party tool with Backup Agent co-resident / Snapshot	Full – Application Consistent with VM running		Not supported

Testing

Testing Phase



Functional Testing

- System Acceptance Testing
  - Failure testing of components
- Application Testing
  - Menu testing
- Network Readiness Assessment
  - Agent Site
    - QOS
  - DataCentre
    - QOS

What is Volume Testing

What it is

- High volume of calls coming into the most frequently used call flow. Its objective is to test end to end solution at the required specification. ***

What it is not

- Covers all possible functional tests.

What it is good at

- Tests end to end. Burns in new development such as backend integration. Great for leaks especially in the desktop. Go Live proof point

What is stress testing

- Testing beyond the specifications

Choosing a Volume Testing Tool

Empirix Hammer IP

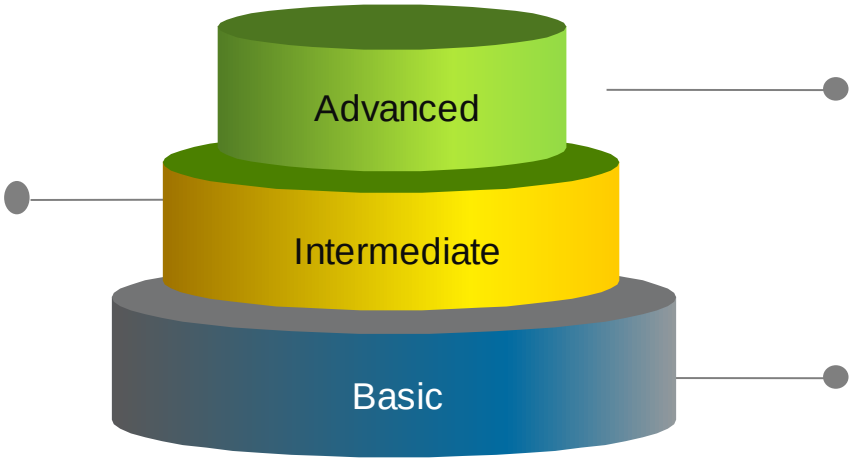
IP Communications and Contact Center Testing

SIPp

Comprehensive Customer Experience Testing

Choosing a Tool

- Can simulate Agent Desktop Can simulate IP phone
- Can Check desktop variables
- Reporting of results
- Scripting of call flow
- Can support Barge in
- Can support Time of day prompts



- Speech recognition in multiple languages
- Debugging – voice playback, script flow, ASR confidence
- Supports high volume
- Voice MOS scores
- ASR traversal of menus

- Generates calls (SIP,TDM)
- Allows DTMF traversal of menus

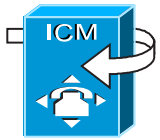
An example call volume script flow

Associated Step(s)

			Step	Description	Expect to Hear	Reply With	Reply Type	Min / Max Pause Time	Minor/ Major	Min Conf %	PSST		
▲	▼	✎	0	Time to Connect			DTMF	0/0	5/10	0	0	✕	☐
▲	▼	✎	1	Welcome to KT Customer Center.Press 1 for DTMF ARS and 2 for Speech recognition ARS	K T 고객센터 입니다 {*}{BargeIn} {*} 1 번 쉽게 말로하는 {*} 2 번을눌러 주십시오		DTMF	0/0	3/5	50	1.9	✕	☐
▲	▼	✎	2	Reply 1		1	DTMF	0/0	0/0	0	0	✕	☐
▲	▼	✎	3	Press 1 for product subscription, transfer, change, termination and olleh club inquiries; 2 for problem reporting; 3 for billing and payment; 4 for wired/wireless simultaneous inquiries including mobile phones and Wibro; and 0 to talk to an agent. Press * to repeat.	{*} 이전 변경{*} {BargeIn} 올레클럽문의는 1번 {*}, 고장신고는 2번,요금및 {*},핸드폰, 와이브로 및 유무선 동 시 {*} 다시들기는 {*}		DTMF	0/0	5/10	30	15	✕	☐


High Level Monitoring

Prime Collaboration Assurance: Contact Centre



ICM Router

CVP
Customer Voice Portal

EIM/WIM
Email/Web Interaction Manager

MediaSense

SocialMiner

Finesse

PG
Peripheral Gateway

AW
Admin Workstation

CUIC
Intelligence Centre

CVP – OAMP
(Operate, Admin, Monitor, Provision)

CTIOS

RSM
(Remote Silent Monitoring)

Vcentre/ESXi)

UCCX
Contact Centre Express

Voice
Gateway

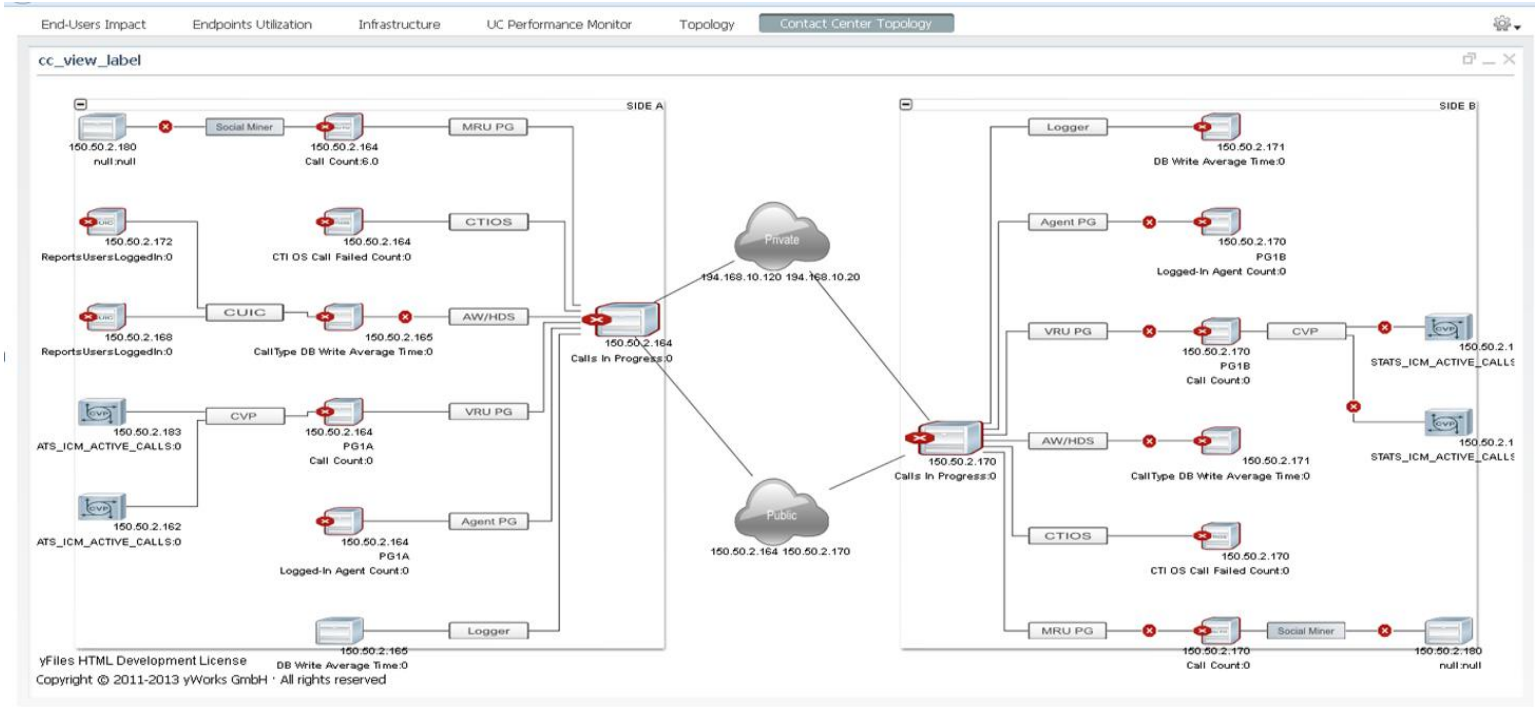
SIP Proxy

CUBE
(Border Element)

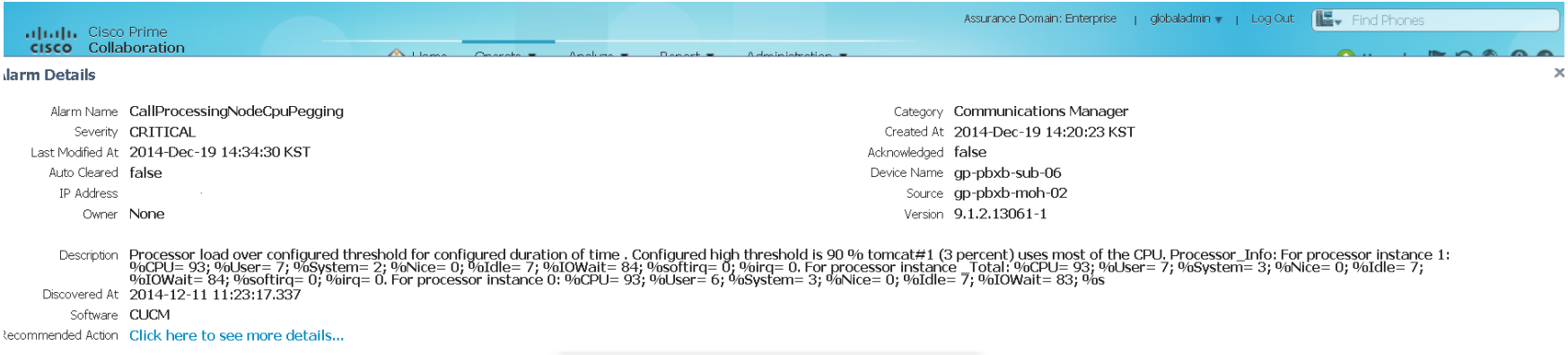
Communications Manager

Agent
IP Phone

Prime Collaboration Assurance: Contact Centre

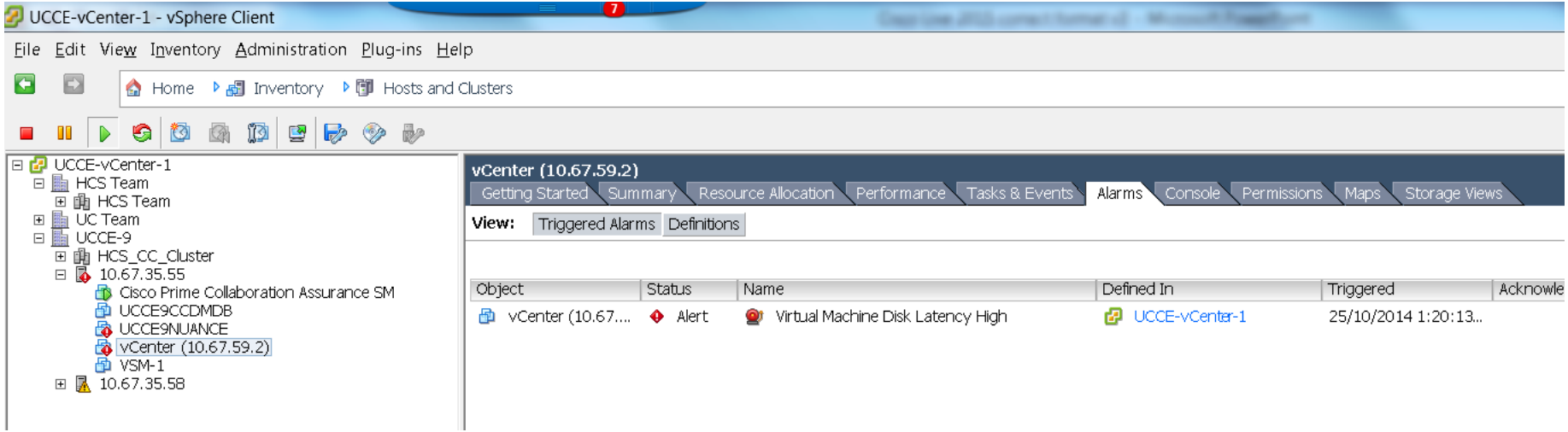


Prime Collaboration – Alarms

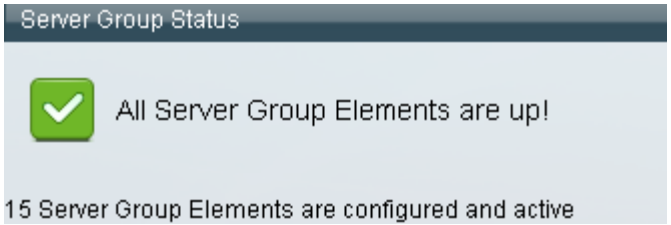


What went wrong here?

vCentre Viewpoint



Infrastructure Through CUSP SIP Options Ping



Server Group Status

Server Group / Element	Status
CA-CUSP-FARM	up
GH-CUSP-FARM	up
GP-CUSP-FARM	up
GR-3RDPTY-CUBE-FARM	up
GR-ASR-FARM	up
GR-CVP-FARM-GRP-ALL	up
GR-CVP-FARM-GRP1	up
GR-CVP-FARM-GRP2	up
GR-CVP-FARM-GRP3	up
GR-CVP-FARM-GRP4	up
GR-CVP-FARM-GRP5	up
GR-GP-CCM-CL1.ktqq.ipcc.com	up
GR-GP-CCM-CL2.ktqq.ipcc.com	up
GR-IG-CUBE-FARM	up
GR-VXML-GW-FARM	up

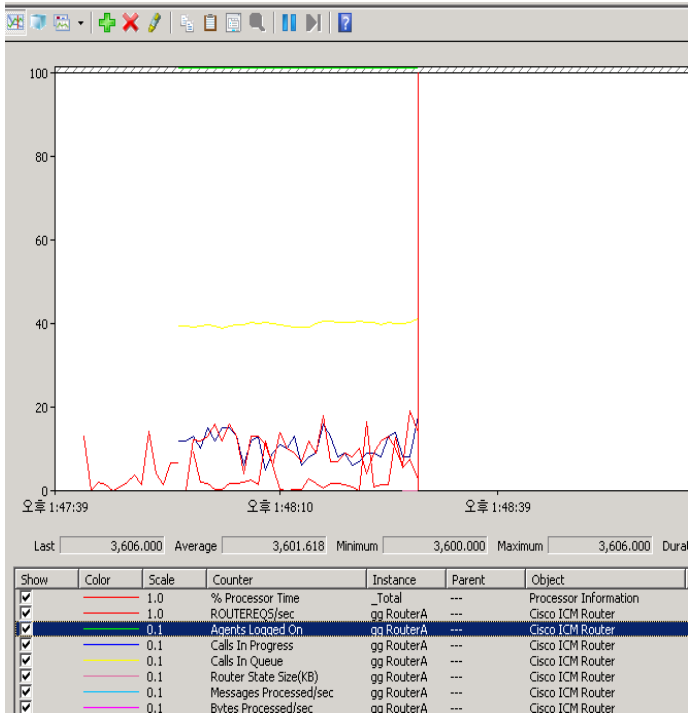
VXML Servers Through the Load Balancer Probe

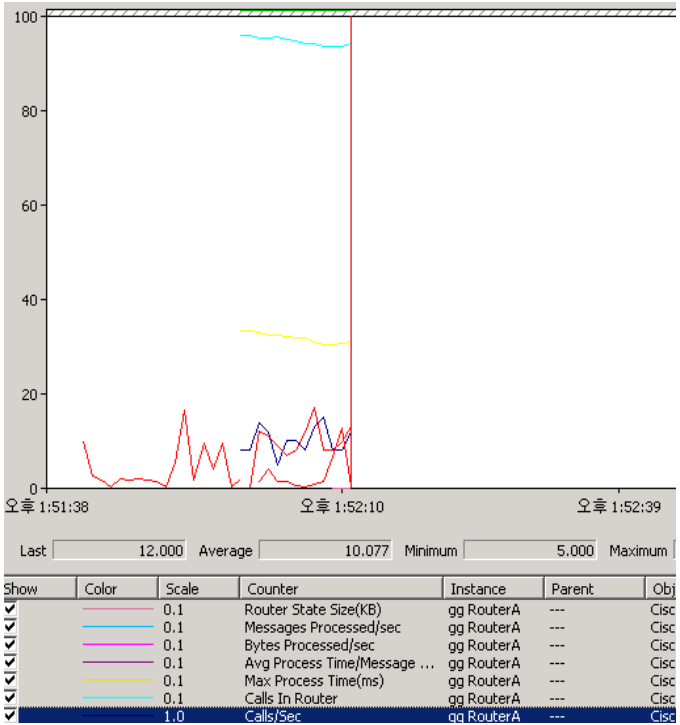
```
gr-nw-14-ace4710-01/Admin# sh serverfarm GR_VXML_SVR_FARM

serverfarm     : GR_VXML_SVR_FARM, type: HOST
total rservers : 10
state          : ACTIVE
DWS state      : DISABLED
----------------------------------

                                                  ----------connections----------
     real                    weight state         current    total      failures
  ---+--------------------+------+------------+----------+----------+---------
  rserver: grivrcall01
                   :7000     8    OPERATIONAL     0          543854     0
  rserver: grivrcall03
                   :7000     8    OPERATIONAL     0          565995     0
  rserver: grivrcall05
                   :7000     8    OPERATIONAL     0          566075     0
  rserver: grivrcall07
                   :7000     8    OPERATIONAL     0          566279     0
  rserver: grivrcall09
                   :7000     8    OPERATIONAL     0          566915     0
  rserver: grivrcall11
                   :7000     8    OPERATIONAL     0          565483     0
  rserver: grivrcall13
                   :7000     8    OPERATIONAL     0          567012     0
  rserver: grivrcall15
                   :7000     8    OPERATIONAL     0          566403     0
  rserver: grivrcall17
                   :7000     8    OPERATIONAL     0          555581     0
  rserver: grivrcall19
                   :7000     8    OPERATIONAL     0          566465     0
```

Perfmon



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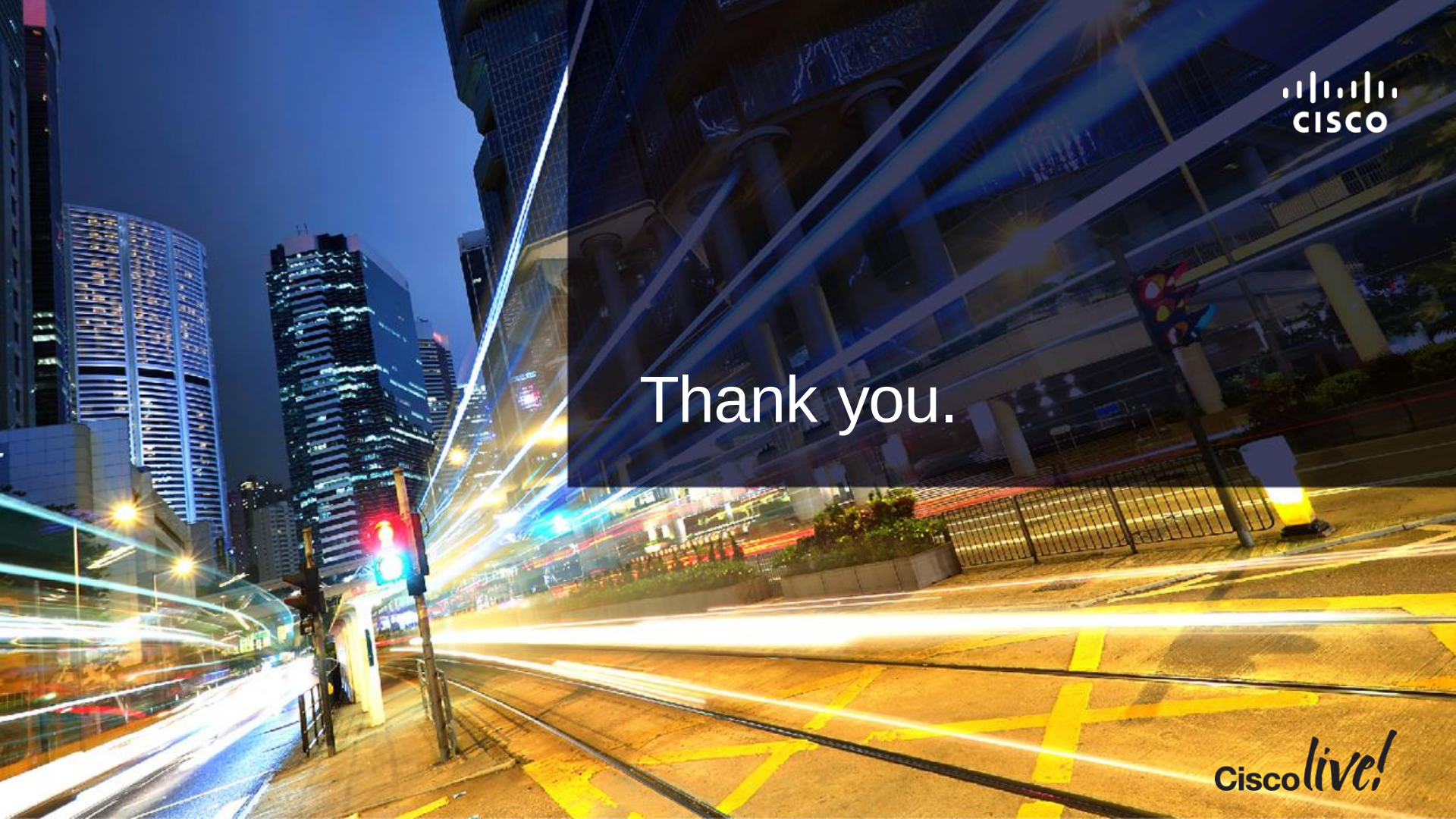
Thank you.


CISCO