Virtuelizacija i Unified Communications

Paulo Jorge Correia
EM TSA
Agenda

UC on UCS why?
What we support on our UC on UCS solution?
What are the management components?
Virtualization eXperience Infrastructure (VXI)
Tested Reference Configurations
Let's configure a Solution using UC on UCS
Q & A
UC on UCS why?
What Business concerns are we addressing?

- **Have your cake and eat it too:** Flexibility with Governance and Cost Control
- **Reduce Total Cost of Ownership:** consolidate everything, simplify management
- **Increasing Business Agility via Cisco Collaboration + Cisco Data Center 3.0**

Why Cisco?

- **Holistic solution** (just running on VMware is not enough)
- **Brodest support** of virtualized UC capabilities
- **Ecosystem** (VCE, HCS, etc. with VMware, EMC, NetApp)
UC Platform Evolution: Accelerating Pace of Innovation

- **1990s**: Legacy Voice Enhancement
  - ~2000: Server (Special-purpose)
  - 2005: Appliance
  - 2010: Virtualization
  - Future: Network Services

**Key Benefits**

- **Business Agility**: Increasing Architectural Flexibility while Decreasing Barriers to Rapidly Deploy/Tailor
- **Footprint, space, Energy, Cabling**: Increasing “Miniaturization”, Consolidation & Avoidance while Increasing Efficiency
- **Investment Leverage**: No Forklifts ➔ Network Convergence ➔ Commodity Servers/Storage ➔ Virtualization
- **Business Continuity**: Increasing Security, Resiliency and options for High Availability / Disaster Recovery
- **Management Simplification**: Increasing Familiarity, Centralization, Scale and Efficiency
Cisco Unified Communications Combined with Cisco UCS leverages the full benefits of a converged network and virtualization to deliver real near-term benefits as well as long-term extensibility.

**Reduces Capital Expenditures**
- Fewer Servers, adapters, cables required
- Consolidate voice, video, data, mobility, storage access
- Reduces storage needs

**Reduces Operating Expenses**
- Further consolidates system management
- Reduces facilities costs; power, cooling, space, cabling
- One-time wiring serves all communications

**Increases Business Agility**
- Leverages platform/infrastructure to expand applications
- Eases provisioning of new services
- Accelerates collaboration rollout
Data Center vs. Communications Architectures

Same TCO Drivers: Technology, Facilities, Management Burden

Data Center 1.0 with Traditional Communications
- Mainframe
- PBX
- Too Many Networks
- Centralized Operations
- Controlled but Inflexible
- High TCO

Data Center 2.0 with Unified Communications
- Servers and Appliances
- Converged Network
- Too Many Fabrics
- Distributed Operations
- Flexibility, but with Sprawl
- Medium to High TCO

Data Center 3.0 with Virtualized Communications
- Virtualized Compute/Storage
- The Network
- Unified Fabric & Networks
- Flexible Operations
- Agility + Governance
- Low TCO
What we support on our UC on UCS solution?
“UC on UCS” B-series Overview
Updated for Cisco Unified Communications 8.5(1)

• Broadest support for Virtualized Collaboration
  Unified Communications Manager with Integrated Mobility
  Unified Communications Manager – Session Management Edition
  Emergency Responder
  Unity Connection and Unity
  Unified Presence
  Unified Contact Center (Enterprise & Express)
  Unified Customer Voice Portal
  Unified Communications Management Suite

• Target Market
  Medium to high server count & concentration
  “Ready, willing, able” to support servers, VMware, storage

• Solution Details
  Deployment Models - application co-residency support
  VMware vSphere 4 – ESXi 4.0 only, defined VM templates only, most feature support deferred (Vmotion, etc.)
  Supported Servers – for majority, UCS B200 only at this time
  Supported Storage - for majority, DAS+SAN only
“UC on UCS” C-series Overview
Updated for Cisco Unified Communications 8.5(1)

• Initial Collaboration support at FCS
  Unified Communications Manager with Integrated Mobility
  Unified Communications Manager – Session Management Edition
  Emergency Responder
  Unity Connection
  Unity (C210 only)
  Unified Presence
  Unified Contact Center Express
  Unified Contact Center Enterprise (C210 only)
  Unified Customer Voice Portal (C210 only)
  Unified Communications Management Suite

• Target Market
  Low to medium server count
  Ready to move off an appliance model (server/VMware admin)

• Solution Details
  Deployment Models – application co-residency support
  VMware vSphere 4 – required, same “rules” as with UCS B-series
  Supported Servers – UCS C210 and C200 M2 only
  Supported Storage – DAS-only for C200, DAS or DAS+SAN for C210
UC Virtualization Versions

Legacy Virtualization Support
- Unity 7.x (FCS Feb 2009)
  - “Software-only“
- Unified Contact Center Enterprise 7.5 (FCS Nov 2008)
  - “Software-only”
  - Peripheral Gateways
- Client AW
- Rest of UC
  - Cisco-internal labs only

UC 8.5 on UCS
- UC on UCS B-series
  - UCS B200 M1/M2
- UC on UCS C-series
  - UCS C210 M1/M2
  - UCS C200 M2
- Broad Application Support
  - IP Telephony
  - Session Management
  - Emergency Services
  - Messaging
  - Presence
  - Customer Care
  - Management
What are the management components?
Management Layers

B & C Series HW
Virtual KVMoIP
CIMC
UCS Manager

ESXi Hypervisor
vCenter vs. Standalone

LAN / SAN / SAN Storage
Depends on the vendor/DC team

Cisco UC Applications
Web GUI/CLI (CUCM/UnityC/etc)
Windows Apps (UCCE/CVP/etc)
B & C Series HWV Management

B-Series via UCS Manager
Chassis
Network Cards
Blades etc.
Virtual KVMoIP

C-Series via Web Browser
Inventory
Boot Order
Firmware Mgmt
Virtual KVMoIP
B & C Series Console Access KVM over IP

ESXi Installation

Launch Virtual KVM Console Applet
Launch Virtual Media
Map ESXi ISO File as CD/DVD

Start Installation
When done access ESXi via vSphere Client
Managing the System (B & C Series) – VMware Layer

Post VMware ESXi 4.0 installation and network setup (SAN/LAN etc.)

- ESXi 4.0 Required - Standalone or better
- vSphere client is required
- vCenter is highly recommended
  - B-Series deployments
  - C-Series / smaller deployment – standalone client acceptable
  - Enables enhanced VMware features with vCenter
Managing Virtual UC Application (B & C Series)

At login to the CLI and GUI, the VM configuration is displayed

Virtual UC Apps are NOT aware of the type of hardware being used (servers) nor the type of storage.

No VM BIOS management
No hardware management and monitoring

New iostat information is added to RTMT and logged (perfomon counters) to help debug Disk I/O related issues on the SAN
Deploying UC Virtual Machine – B&C Series

Download Software

1. Select Product
2. Select Software Type
3. Select Software

- Voice and Unified Communications > Cisco Unified Communications Manager Version 8.0
- Select a Software Type:
  - Unified Communications Manager Recovery Software
  - Unified Communications Manager Update
  - Unified Communications Manager Virtual Machine Templates
  - Unified Communications Manager CallManager Device Packages
  - Unified Communications Manager CallManager Locale Installer

OVF Templates Provided by Cisco

Remote KVM and Media via CIMC

UCS C210 M1

UCS B200 M1

UC VM OVF Templates: http://www.cisco.com/go/uc-virtualized
Virtualization eXperience Infrastructure (VXI)
IT Struggles To Bring Together VDI And Collaboration

Desktop Virtualization
Data security & compliance
Business continuity/agility
Reduced TCO
Consistent IT and end user Experience

Collaboration
Video and voice
Interactive
Real time, high quality experience
Range of devices
Cisco Vision For Virtualization Experience Infrastructure (VXI)

- Validated desktop virtualization solution
- Fully tested with open ecosystem of partners
- Superior collaboration experience
- Unsurpassed device versatility and mobility
- Enterprise-class performance, security and manageability
- Best in class ROI
Cisco Announces Open, Integrated, Validated Architecture And New Ecosystem Partners

Virtualized Data Center
- Cisco Collaboration Applications
- MS Office
- Desktop Virtualization Software
- Hypervisor
- Virtual CUCM
- Virtual QUAD

Virtualization-Aware Borderless Network
- Branch
- CDN
- ISR
- WAAS
- Cisco WAN

Virtualized Collaborative Workspace
- Cisco Clients
- Cius Business Tablets
- Cisco Desktop Virtualization Endpoints
- Thin Client Ecosystem
- Wyse, Devon IT, iGEL

End-to-End Security, Management and Automation
New Cisco Endpoints To Bring Together VDI And Collaboration

New Desktop Virtualization Endpoints Simplify IT Deployment, Security, Scalability

- Integrated form factor for Unified IP Phone 8900/9900 Series uses existing PoE and desktop phone—only requires monitor and keyboard
- Standalone VDI form factor for customers without Unified IP Phone 8900/9900 Series—first PoE Desktop solution

Cisco Cius: first mobile converged endpoint for voice, video, data applications and VDI

All endpoints support VMware View 4.5 and Citrix XenDesktop
Cisco VXI: Virtualized Workspace

http://www.cisco.com/go/vdi
Cisco Advanced Services Offers for UC on UCS

- Plan & Design Service
  For channel partner enablement
- Configuration & Performance Audit
  For UC, on existing UCS deployment
- Operation Support Planning Workshop
- Pre-Production Pilot Service
  Fixed and Custom options
- Accelerated Deployment Service
  Greenfield and Migration options
- Project Management

For more details, see:
www.cisco.com/go/unifiedcomputingservices and
Tested Reference Configurations
Cisco UCS B200Mx (UCS-B200Mx-VCS1)
B200M1/M2 TRC #1

Configuration (M1):
- 32GB RAM
- 2 x 5540 CPU
- 2 x 146GB DAS Drives
- M71kR-Q CNA Adapter

Configuration (M2):
- 48GB RAM
- 2 x E5640 CPU
- 2 x 146GB DAS Drives
- UCS M8IKR VIC

Management:
Supports multiple VMs
UCS Manager
vSphere/vCenter
Cisco UCS C210M1 (UCS C210M1-VCD1)
C210M1 TRC #1

Configuration:
Dual Quad core E5540
12GB RAM
6x146GB DAS Drives
(w/ SAS Extender)
2x1GB NICs Ethernet
1x1GB NIC for CIMC
Not field upgradable

Management:
Supports 1 VM
CIMC for UCS
vSphere/vCenter

NO FIELD UPGRADEABLE TO C210-M1 TRC#2
Cisco UCS C210 Mx (UCS C210 Mx-VCD2)

C210 M1 TRC #2 or C210 M2 TRC #1

Configuration:
- **10x146GB** DAS Drives (w/ SAS Expander)
- **6x1GB** NICs Ethernet
  - 2 motherboard
  - 4 on PCI card
- **1x1GB NIC** for CIMC

Management:
- Supports multiple VMs
- CIMC for UCS
- vSphere/vCenter
Cisco UCS C210Mx
C210M1 TRC #3 OR C210M2 TRC# 2

Configuration:
- 2x146GB DAS Drives
- 6x1GB NICs Ethernet
- 2 motherboard
- 4 on PCI card
- 1x1GB NIC for CIMC
- HBA Adapter
  - 2x4GB for FC

Management:
- Supports multiple VMs
- CIMC for UCS
- vSphere/vCenter
Cisco UCS C200M2 (UCS C200M2-VCD2) C200M2 TRC #1

Configuration:
- Dual Quad Core E5506
- 4x1TB DAS Drives
- 24GB RAM
- 2x1GB NICs Ethernet
- 1x1GB NIC for CIMC

Management:
- Supports multiple VMs
- CIMC for UCS
- vSphere/vCenter
Lets configure a Solution using UC on UCS
Virtual Machine specification

- Number of VMs typically the same as physical MCS’s
- But Virtual Machines are measured by:
  - vCPU
  - vRAM
  - vDisk
  - vNICs
- A VM solution can be deployed on any “supported” hardware mix that meets the specified resource
- Multiple VMs on same physical HW
UC Deployment Model (Application)

- **All** UC Deployment Models are supported
  - No change in the current deployment models
  - Base deployment model – Single Site, Centralized Call Processing, etc. are not changing

- **NO** software checks for design rules
  - No rules or restrictions are in place in UC Apps to check if you are running the primary and sub on the same blade

- Clustering over WAN (COW) **is supported**
  - Does not depend on CUCM code or hardware

- Mega-Cluster is **NOT** supported until CUCM 8.5

# Tested Reference Configurations

<table>
<thead>
<tr>
<th>Server Model/Generation &amp; Tested Reference Configuration</th>
<th>Collaboration SKU</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>B200 M2 TRC #1</td>
<td>UCS-B200M2-VCS1</td>
<td>Co-res, SAN</td>
</tr>
<tr>
<td>B200 M1 TRC #1</td>
<td>UCS-B200M1-VCS1</td>
<td>Co-res, SAN</td>
</tr>
<tr>
<td>C210 M2 TRC #1</td>
<td>UCS-C210M2-VCD2</td>
<td>Co-res, DAS</td>
</tr>
<tr>
<td>C210 M2 TRC #2</td>
<td>DC SKU only</td>
<td>Co-res, SAN</td>
</tr>
<tr>
<td>C210 M1 TRC #1</td>
<td>UCS-C210M1-VCD1</td>
<td>Single VM, DAS</td>
</tr>
<tr>
<td>C210 M1 TRC #2</td>
<td>UCS-C210M1-VCD2</td>
<td>Co-res, DAS</td>
</tr>
<tr>
<td>C200 M2 TRC #1</td>
<td>UCS-C200M2-VCD2</td>
<td>Co-res, DAS (1K users)</td>
</tr>
</tbody>
</table>

M2 TRC are Pre-FCS. Actual HW might change
### Unified Communications Manager | Output

<table>
<thead>
<tr>
<th>Output</th>
<th>Defaults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unified CM server type</td>
<td>MCS-7845i3 (✓)</td>
</tr>
<tr>
<td>Maximum Desired Unified CM Call Processing Server Pairs per Cluster</td>
<td>4 server pairs (always minimizes cluster count) (✓)</td>
</tr>
</tbody>
</table>

### Utilization

<table>
<thead>
<tr>
<th></th>
<th>IPT Servers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Processing Capacity Utilized per Call Processing Server</td>
<td>15.77%</td>
</tr>
<tr>
<td>Memory Capacity Utilized per Call Processing Server</td>
<td>22.85%</td>
</tr>
<tr>
<td>Endpoints Capacity Utilized per Call Processing Server</td>
<td>88.83%</td>
</tr>
<tr>
<td>CTI Capacity Utilized per Call Processing Server</td>
<td>0%</td>
</tr>
</tbody>
</table>

### Server

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated min number of clusters</td>
<td>1</td>
</tr>
<tr>
<td>Publisher Servers</td>
<td>1</td>
</tr>
<tr>
<td>TFTP Servers</td>
<td>2</td>
</tr>
<tr>
<td>Minimal Number of Unified CM Call Processing Server Pairs</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Number of Servers (minimal)</strong></td>
<td><strong>9</strong></td>
</tr>
</tbody>
</table>
## Unified Communications Manager | Output

<table>
<thead>
<tr>
<th>Output</th>
<th>Defaults</th>
<th>Help</th>
</tr>
</thead>
</table>

### Utilization

<table>
<thead>
<tr>
<th></th>
<th>IPT VMs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call Processing Capacity Utilized per Call Processing VM</td>
<td>19.46%</td>
</tr>
<tr>
<td>Memory Capacity Utilized per Call Processing VM</td>
<td>22.85%</td>
</tr>
<tr>
<td>Endpoints Capacity Utilized per Call Processing VM</td>
<td>88.89%</td>
</tr>
<tr>
<td>CTI Capacity Utilized per Call Processing VM</td>
<td>0%</td>
</tr>
</tbody>
</table>

### Server

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated minimum number of clusters</td>
<td>1</td>
</tr>
<tr>
<td>Publisher Servers</td>
<td>1</td>
</tr>
<tr>
<td>TFTP(s) VMs</td>
<td>2</td>
</tr>
<tr>
<td>Minimal Number of Unified CM Call Processing VMs Pairs</td>
<td>3</td>
</tr>
</tbody>
</table>

### Total Number of VMs (minimal)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Number of VMs (minimal)</strong></td>
<td><strong>9</strong></td>
</tr>
</tbody>
</table>

### Total Unified CM VM Resources Needed

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>vCPUs</strong></td>
<td><strong>18</strong></td>
</tr>
<tr>
<td><strong>RAM (GB)</strong></td>
<td><strong>54</strong></td>
</tr>
<tr>
<td><strong>vDisk (GB)</strong></td>
<td><strong>1440</strong></td>
</tr>
<tr>
<td><strong>vNICs</strong></td>
<td><strong>9</strong></td>
</tr>
</tbody>
</table>
## Supported VM Configurations 8.5(1)

<table>
<thead>
<tr>
<th>Product</th>
<th>Scale (users)</th>
<th>vCPU</th>
<th>vRAM (GB)</th>
<th>vDisk (GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUCM</td>
<td>1,000</td>
<td>1</td>
<td>4</td>
<td>2 x 80</td>
</tr>
<tr>
<td>CUCM</td>
<td>7,500</td>
<td>2</td>
<td>6</td>
<td>2 x 80</td>
</tr>
<tr>
<td>UCx</td>
<td>500</td>
<td>1</td>
<td>2</td>
<td>1 x 160</td>
</tr>
<tr>
<td></td>
<td>5,000</td>
<td>2</td>
<td>4</td>
<td>1 x 200</td>
</tr>
<tr>
<td></td>
<td>10,000</td>
<td>4</td>
<td>4</td>
<td>2 x 146</td>
</tr>
<tr>
<td></td>
<td>20,000</td>
<td>7</td>
<td>8</td>
<td>2 x 300</td>
</tr>
<tr>
<td>Unity</td>
<td>5,000</td>
<td>2</td>
<td>4</td>
<td>4 x 24</td>
</tr>
<tr>
<td></td>
<td>15,000</td>
<td>4</td>
<td>4</td>
<td>4 x 24</td>
</tr>
<tr>
<td>CUP</td>
<td>2,500</td>
<td>2</td>
<td>4</td>
<td>1 x 80</td>
</tr>
<tr>
<td></td>
<td>5,000</td>
<td>4</td>
<td>4</td>
<td>2 x 80</td>
</tr>
<tr>
<td>UCCX/IPIVR</td>
<td>300</td>
<td>2</td>
<td>4</td>
<td>2 x 146</td>
</tr>
</tbody>
</table>

1 vCPU for UCx ESXi scheduler
Server Selection Guideline

Start

> 10 “servers”

Yes

> 24 vCPU?

No

Yes

Already have DC/SAN?

$${$$

Yes

Building DC for UC?

No

C200M2

Yes

> 8vCPU or > 1000 users

C210Mx DAS

No

C210Mx SAN

No

Yes

UCS B200
UC on UCS B-series Value Proposition

Significant TCO Benefits to Customer

Example: 5,000 users
Dial tone, voicemail and Presence, 10% are Contact Center Agents
11 non-virtualized rack servers required for UC, more for other business apps

CAPEX
- Reduced Server Count (50-75%)
- Storage Consolidation (50+%)  
- Reduced Network Ports (50+%)  
- Reduced Cabling (50+%)  

OPEX
- Reduced Rack & Floor Space (36%)
- Reduced Power/Cooling (20+%)  
- Fewer Servers to Manage (50-75% less)
- Reduced Maintenance/Support Costs (~20%)
Example: 5,000 users
Dial tone, voicemail and Presence, 10% are Contact Center Agents
11 non-virtualized rack servers required for UC, more for other business apps

CAPEX/OPEX
- Similar Consolidation and Operational Efficiency/Scale benefits as with UC on UCS B-series

Other Benefits
- Lower initial investment
- Simple entry/migration to virtualized UC – Data Center expertise not required unless using SAN option
## Server Requirement – 12K Devices/Users

<table>
<thead>
<tr>
<th>B200-1</th>
<th>B200-2</th>
<th>B200-3</th>
<th>B200-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU-1</td>
<td>CPU-2</td>
<td>CPU-1</td>
<td>CPU-2</td>
</tr>
<tr>
<td>PUB</td>
<td>TFTP-1</td>
<td>SUB-1</td>
<td>SUB-3</td>
</tr>
<tr>
<td>SUB-5</td>
<td>SUB-5</td>
<td>SUB-7</td>
<td>SUB-2</td>
</tr>
<tr>
<td>UCCX-1</td>
<td>UCCX-1</td>
<td>UCCX-1</td>
<td>UCCX-1</td>
</tr>
<tr>
<td>CPU-1</td>
<td>CPU-2</td>
<td>CPU-1</td>
<td>CPU-2</td>
</tr>
<tr>
<td>SUB-8</td>
<td>UCCX-2</td>
<td>CUP-1</td>
<td>SUB-4</td>
</tr>
<tr>
<td>SUB-4</td>
<td>TFTP-2</td>
<td>CUP-2</td>
<td>CUP-2</td>
</tr>
</tbody>
</table>

**Input**

- 12K Phones
- 10K Messaging Users
- 10K CUPC Clients
- 240 UCCX Agents
- 10 Supervisors

**MCS Servers**

<table>
<thead>
<tr>
<th></th>
<th>CUCM</th>
<th>UCxn</th>
<th>UCCX</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUCM</td>
<td>11</td>
<td>2</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>UCxn</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>UCCX</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
<td><strong>2</strong></td>
<td><strong>2</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

**B200 Servers**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>B200-1</td>
<td>6</td>
</tr>
<tr>
<td>B200-2</td>
<td></td>
</tr>
<tr>
<td>B200-3</td>
<td></td>
</tr>
<tr>
<td>B200-4</td>
<td></td>
</tr>
<tr>
<td>B200-5</td>
<td></td>
</tr>
<tr>
<td>B200-6</td>
<td></td>
</tr>
</tbody>
</table>

**OVAs Used**

- CUCM: 2 vCPU 6 GB RAM, 7.5K users
- CUC: 4 vCPU 4 GB RAM, 10K users
- CUP: 4 vCPU 4 GB RAM, 5K users
- UCCX: 2 vCPU 4 GB RAM, 300 agents
Q&A
Registrujte se za Cisco Live Networkers u Londonu ili Bahreinu!
Više informacija na:
http://www.ciscolive.com/