Hosted Collaboration Solution
Technical Solution Overview

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Cisco Collaboration Portfolio

- TELEPRESENCE
- CONFERENCING
- CUSTOMER CARE
- IP COMMUNICATIONS
- MOBILE APPLICATIONS
- ENTERPRISE SOCIAL SOFTWARE
- MESSAGING
- ON PREMISES
- HYBRID
- CLOUD
Agenda

HCS Overview

Unified Communications 8.6

HCS Management System
- Service Fulfillment
- Platform Manager
- Service Inventory (Billing)
- Service Assurance

Optimized Cloud Platform
- Unified Computing System
- Virtualization

Resilient Network Architecture
- HCS Datacenter Architecture
- HCS Security
- HCS Telephony Architecture
- Customer Premise
Hosted Collaboration Solution

Overview
Hosted Collaboration Solution (HCS)

• Enables service providers, partners, and system integrators to offer Cisco UC services from the cloud

• Leverages Cisco’s Unified Communication and Collaboration 8.6 portfolio

• Comprehensive management system for simplified provisioning and monitoring

• Platform based off VMware running on Cisco Unified Computing System (UCS)

• Flexible deployment models for different customer sizes and requirements

• Perpetual licenses that allows for pooling and transferring between customers
Multi-Customer UC Platform

- **Shared Hardware (VMware on Cisco UCS)**
- **Unique/Private Cisco UC application instances per customer**
- **Consistent UC feature set from the HCS cloud platform**

The diagram shows a HCS Datacenter connected to Cisco Unified Computing System, with three customers (Customer 1, Customer 2, Customer 3) each having their own unique/private Cisco UC application instances.
Hosted Collaboration Solution Elements

- Unified Communication & Collaboration Applications
- HCS Management System
- Cloud Optimized Platform
- Resilient Network Architecture
Hosted Collaboration Solution

Unified Communications 8.6
## Cisco HCS Applications

<table>
<thead>
<tr>
<th>Services</th>
<th>Product</th>
<th>Same as Premises Deployed App</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voice &amp; Video</td>
<td>Unified Communications Manager, Unified IP Phones, Jabber</td>
<td>Yes</td>
</tr>
<tr>
<td>Voice Mail &amp; Integrated Messaging</td>
<td>Unity Connection</td>
<td>Yes</td>
</tr>
<tr>
<td>Presence &amp; Instant Messaging</td>
<td>Unified Presence, Jabber</td>
<td>Yes</td>
</tr>
<tr>
<td>Mobility Services</td>
<td>Unified Mobility, Mobile Clients</td>
<td>Yes</td>
</tr>
<tr>
<td>Web Collaboration</td>
<td>WebEx Meeting Center</td>
<td>Yes</td>
</tr>
<tr>
<td>Attendant Console</td>
<td>Cisco Unified Enterprise Attendant Console</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Unified Communications Manager

Conferencing w/ video

Cisco clients w/ video

Cisco Unified Communications Manager

Social networking

3rd party clients

Video applications

Cisco Unified Contact Center
Cisco UC Endpoint Portfolio

- Basic Voice Communications Endpoints
  - 3900 Series
- Business Communications Endpoints
  - 6900 Series
- Advanced Business Communications Endpoints
  - 7900 Series
- Advanced Professional Media Endpoints
  - 8900 Series
- Advanced Collaborative Media Endpoints
  - 9900 Series
- Mobile Collaborative MediaEndpoints
  - Cisco Cius
Best Experience Across Devices

- Changes in device ownership
- More choice - When, where, how & what device
Cisco Jabber: Same Services for Any Workspace
Microsoft Integrations

MS Office Communicator Plugin

- Fully integrated Cisco softphone
- Deskphone control
- Phone presence
- Inbound call notification & divert
- Voicemail MWI & access

MS Office Communicator Plugin

- Right Click
- Persona Menu
- Ribbon Icon
- Contact Card
# HCS Application Bundles

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Collaboration Apps</th>
<th>Essential*</th>
<th>Foundation</th>
<th>Standard</th>
<th>Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Call Control</td>
<td>3905, 6901, or Analog</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Full Voice/Call Control</td>
<td>Enhanced UCL</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td># of Devices</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Mobility (SNR)</td>
<td>Cisco Unified Mobility</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Native Video</td>
<td>Video Endpoint(s)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Messaging</td>
<td>Unity Connection</td>
<td>O</td>
<td>O</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Presence</td>
<td>Cisco Unified Presence</td>
<td>O</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Soft Client License</td>
<td>CUPC/CIPC/CUCI/CUVA</td>
<td>O</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Session Mgmt</td>
<td>SME</td>
<td>O</td>
<td>O</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Mobile Client License</td>
<td>Cisco Mobile Clients</td>
<td>O</td>
<td>O</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Video Conferencing</td>
<td>TelePresence UCM UCL</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Web Conferencing</td>
<td>Cisco WebEx</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Contact Center</td>
<td>Unified Contact Center</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td></td>
</tr>
</tbody>
</table>

* HCS Essential License does not count toward the cumulative volume tiers

✓ = Included  O = Optional Add-ons
Hosted Collaboration Solution

Management System

Service Fulfillment and Service Assurance
HCS Management Framework

Cross-Domain Aggregation, Coordination, Correlation, Presentation

Enable cross-domain functions that can be easily integrated into OSS

Manage a Diverse Component Set

Normalized Interfaces

Mediation Layer

OSS/J
MTOSI
Java
SOAP
XML

Domain Manager #1
Domain Manager #2
Domain Manager #3
Domain Manager #4
Domain Manager #5
HCS Management Architecture

Service Fulfillment
- Service Management Layer (Future)
- Mediation Layer (Future)
- Service Inventory
  - Platform Manager
  - UCDM

Billing
- SP Billing Server
  - ISI*

Service Assurance
- Existing OSS/BSS
  - SNMP Syslog
  - Hosted Collaboration Mediation Dashboard
    - InfoVista*
  - UOM/SM
  - vCenter
  - UCSM*
  - DCNM*

Cisco Unified Communications

CPE

Datacenter

UCS

SAN

*Optional component or reference sale
HCS Management Architecture

Service Fulfillment
- Service Management Layer (Future)
- Mediation Layer (Future)

Billing
- SP Billing Server
- ISI*

Service Assurance
- Existing OSS/BSS
- SNMP
- Syslog

Cisco Unified Communications
- CPE
- Datacenter
- UCS
- SAN

InfoVista*

Platform Manager
- UCDM
- Service Inventory

*Optional component or reference sale
Service Fulfillment Architecture

Service Fulfillment Bundle-Based Billing
Service Inventory

UCDM Billing API

Cisco Unified Communications Domain Manager
Admin Interface
Bulk Administration
End User Self-Care
Unified Communications Application Configuration

 AXL/SOAP

Cisco Unified Communications Manager
Cisco Unity Connection
Cisco Unified Presence

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Unified Communications Domain Manager

- Provides comprehensive application and client level provisioning of the entire UC infrastructure
- Interfaces at every level of the fulfillment lifecycle
  - Provider System Oversight & Design
  - Customer-Level Direct Administration
  - End User Self Care
- Bulk provisioning
- Audit capabilities

Cisco UCDM is an OEM produced by VOSS
UC Domain Manager’s Benefits

- Automates design, delivery and management of UC
- Business abstraction, not just technology mgmt
- Speeds delivery of new services to customers
- Standardizes configuration & processes
- Differentiates experience across customers
- Provides more control to end users
# UCDM Hierarchy

<table>
<thead>
<tr>
<th>Layer</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Provider Setup</td>
<td>Create Service Building Blocks&lt;br&gt;Install Telephony Model&lt;br&gt;Design Feature Packages&lt;br&gt;Setup Infrastructure</td>
</tr>
<tr>
<td>Customer Creation &amp; Administration</td>
<td>Set Inventory Levels&lt;br&gt;Add Divisions&lt;br&gt;Manage Numbering Plan&lt;br&gt;Assign resources to locations</td>
</tr>
<tr>
<td>Location Creation &amp; Management</td>
<td>Manage &amp; Register Phones&lt;br&gt;Manage End Users &amp; Mobility&lt;br&gt;Admin Group line features</td>
</tr>
<tr>
<td>End-User Self-Care</td>
<td>Manage Phone Features&lt;br&gt;Manage Speed Dials&lt;br&gt;Set Single Number Reach&lt;br&gt;Change Presence monitoring&lt;br&gt;View &amp; Manage Directories</td>
</tr>
</tbody>
</table>
HCS Management Architecture

Service Inventory

Service Fulfillment
- Service Management Layer (Future)
- Mediation Layer (Future)
- Platform Manager
- UCDM

Billing
- SP Billing Server
- ISI*

Service Assurance
- Existing OSS/BSS
- SNMP
- Syslog
- UOM/SM
- vCenter
- UCSM*
- DCNM*
- HCS Component
- HCS Domain Manager
- SP/Partner Supplied

Cisco Unified Communications

CPE

Datacenter

UCS

SAN

*Optional component or reference sale
Service Inventory

- Web-based user interface
  - Configuration
  - Scheduling
- Web service
  - Billing data retrieval
  - Process billing data
  - Generates HCS Service Inventory reports
  - Uses a Cisco common format
  - Customizable output
- Automatically transfers reports via SFTP
  - Regular, configurable interval
- Billing reports backup repository
Platform Manager Features

- **Platform Manager - HCS 8.6.1**
  - Supports upgrade tasks with optional automatic reboot
  - Create, stop, and view tasks
  - Single web interface
  - Support for Cisco UCM, UCxN, and CUP (8.6.1 or later only)

- **Server groups**
  - A collection of servers of the same type (e.g. - CUCM)
  - Not restricted by cluster (customer) or server role (e.g. - Pub vs. Sub)
  - Tasks are applied to one or more server groups
  - All servers in a server group are upgraded at the same time
  - Server groups can be sequenced one after another

- **Roadmap items**
  - Switch versions and Reboot tasks
  - Editing, restarting, and cloning of tasks
  - Appliance model platform
Platform Manager Architecture

Platform Manager

File Verification

Cisco Unified Communications Manager

AXL/SOAP

FTP

SFTP

Cisco Unity Connection

AXL/SOAP

FTP

SFTP

Cisco Unified Presence

FTP

SFTP

Upgrade File

COP File

File Server
Platform Manager – Scheduling Example

- Upgrade “Pubs” @ 11:00 AM July 31st
- Upgrade “TFTPs” after “Pubs” complete successfully
- Upgrade “Subs” after “TFTPs” complete
HCS Management Architecture

Service Fulfillment
- Service Management Layer (Future)
- Mediation Layer (Future)

Billing
- SP Billing Server

Service Assurance
- Existing OSS/BSS
  - Hosted Collaboration Mediation Dashboard
    - SNMP
    - Syslog
  - UOM/SM
  - vCenter
  - UCSM*
  - DCNM*

Cisco Unified Communications
- CPE
- Datacenter
- UCS
- SAN

*Optional component or reference sale
## End-to-End Approach to Service Assurance

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>End-to-End Coverage for Differentiating SLAs</strong></td>
<td>Specialized assurance tools covering data center, network, and applications</td>
</tr>
<tr>
<td><strong>Ability to Isolate Faults Quickly</strong></td>
<td>Common dashboard for real-time fault management across all domains</td>
</tr>
<tr>
<td><strong>Anticipating the Problem Before the Customer Calls</strong></td>
<td>Correlation of performance metrics across domains</td>
</tr>
<tr>
<td><strong>Staying Ahead of the Growth Curve</strong></td>
<td>Cross-system capacity management</td>
</tr>
<tr>
<td><strong>Providing Visibility to the Customer</strong></td>
<td>Roles-based access control to allow customer login</td>
</tr>
</tbody>
</table>
Service Assurance Architecture

Hosted Collaboration Mediation Dashboard

SNMP / Syslog

HTTP(S) / IP

Customer Premise
Cisco UC Applications
Datacenter Architecture
Unified Computing System
SAN

Manager of Managers
Case Management System

InfoVista*
Performance and Capacity Monitoring

CUOM
CUSM
vCenter
UCS Manager
DCNM For LAN
DCNM For SAN

SNMP
AXL/SOAP
Syslog
APIs

*InfoVista is a reference sale
Hosted Collaboration Mediation Dashboard

- Aggregates and summarizes information across customers from a number of sub level assurance monitoring tools
  - Alarm summary
  - Phone summary
- Single Sign-on
- Diagnostic testing
- Portlet based
- Role-based administration
  - Segment customers between operators
- Cross-launch into individual instances of domain managers
Service Assurance Architecture

Hosted Collaboration Mediation Dashboard

Existing Service Provider OSS/BSS Systems
- Manager of Managers
- Case Management System

Hosted Collaboration Mediation Dashboard

InfoVista*
- Performance and Capacity Monitoring

CUSM
- Manager of Managers
- Case Management System

vCenter
- UCS Manager
- DCMN For LAN
- DCMN For SAN

SNMP / Syslog
- AXL/SOAP
- Syslog
- APIs

Customer Premise
- Cisco UC Applications
- Datacenter Architecture
- Unified Computing System
- SAN

Cisco UC Applications
- Datacenter Architecture
- Unified Computing System
- SAN

Manager of Managers
- Case Management System

CUOM
- CUSM
- vCenter
- UCS Manager
- DCMN For LAN
- DCMN For SAN

SNMP
- AXL/SOAP
- Syslog
- APIs

*InfoVista is a reference sale
Cisco Unified Operations Manager

- Automated UC network discovery
- Real-time fault and performance monitoring across every UC phone, application, endpoint, and link
- Graphical and detailed views help you easily and rapidly isolate faults in the network
- Diagnostic view displays contextual and group-level statistics at a single portal
- External notifications through email and SNMP traps
- Impromptu and scheduled diagnostic testing with an alarm on failures
Service Assurance Architecture

Existing Service Provider OSS/BSS Systems

Manager of Managers

Case Management System

Hosted Collaboration Mediation Dashboard

InfoVista* Performance and Capacity Monitoring

Cisco Unified Service Monitor

SNMP / Syslog

CUOM

CUSM

vCenter

UCS Manager

DCNM For LAN

DCNM For SAN

SNMP

AXL/SOAP

Syslog

APIs

Customer Premise

Cisco UC Applications

Datacenter Architecture

Unified Computing System

SAN

*InfoVista is a reference sale

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Cisco Unified Service Monitor

- Comprehensive voice-quality measurements, reporting, and alerting
- Phone-based voice-quality reports at the end of the call
- Sensor-based options include Cisco® 1040 and NAM for 60-second update
- Configurable thresholds for alerts and reports
- Dial-plan configuration for call classification
- On-demand call type (CDR) reports
- Out-of-the-box reporting on the most intensively used endpoints
- Integrated with Cisco Unified Operations Manager for service quality alerting and Cisco Unified Service Statistics Manager for reporting
DCNM: Health and Performance Dashboards

- At a glance dashboards for SAN health and performance
- Top and bottom fabric talkers over a span of time
- Hosts dashboard with VM-Host and VM performance stats
- Drill down for detailed performance analytics and trending
- Network Resource Management
- Fault Management
Hosted Collaboration Solution

Optimized Cloud Platform
Unified Computing System (UCS)
Optimized Virtualization Platform

- Built on Cisco’s Unified Computing System platform
- Enhanced resource utilization
  - Optimize CPU usage for greater capacity
  - Reduced disk storage requirements for smaller customers
- Standardized virtual templates
  - Clone and deploy new customers using the “New Identity” scripts
- Augment SLA’s with additional redundancy options
  - VMware High Availability
UCS B-Series Overview

- B-Series Half-Width Blade
- B-Series Full-Width Blade
- 2104XP Fabric Extender
- 6120/6140XP Fabric Interconnect with Embedded UCS Manager
- UCS 5108 B-Series Chassis
  - 8x Half-Width Blades
  - or
  - 4x Full-Width Blades

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HCS UCS Requirements

- UCS B-series blades
  Multiple UCS B-Series blades now supported
  Intel 5600 or 7500 series processors (E7 to be tested soon)
  1066MHz DDR3 ECC RAM or better
  SAN Boot supported with ESXi 4.1 (2x SAS drives otherwise)

- ESXi 4.1 Supported

- SAN storage
  SAN must be on VMware’s hardware compatibility list
  Fibre Channel (FC) only (NAS and iSCSI are not supported)
  FC Drives HDDs @ 10k or 15k rpm (Tier 1 Storage)
  Standard HCS EMC SAN model BOM available
HCS Verified SAN Solution

- **EMC VNX5500**
  - Redundant Service Processors
  - Tiered storage architecture
    - 200GB SSD Flash Drives for IOPS
    - 2TB 7200RPM NL-SAS Drives for TBs
  - EMC SSD-based FAST Cache
  - RAID 5 (4+1) RAID Groups for storage
    - Plus EMC Vault and Spares
  - Disk Array Enclosures (15 Disks/DAE)
### UC Application Resource Requirements

<table>
<thead>
<tr>
<th>Application</th>
<th>vCPU</th>
<th>RAM (GB)</th>
<th>HD(GB)</th>
<th>CPU RESV (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UC Manager – 2,500 Users (Limited)</td>
<td>1</td>
<td>3</td>
<td>55</td>
<td>800</td>
</tr>
<tr>
<td>UC Manager – 2,500 Users</td>
<td>1</td>
<td>4</td>
<td>80</td>
<td>800</td>
</tr>
<tr>
<td>UC Manager – 7,500 Users</td>
<td>2</td>
<td>6</td>
<td>2 x 80</td>
<td>3600</td>
</tr>
<tr>
<td>UC Manager – 10,000 Users</td>
<td>4</td>
<td>6</td>
<td>2 x 80</td>
<td>7200</td>
</tr>
<tr>
<td>Unity Connection – 1000 Users</td>
<td>1*</td>
<td>4</td>
<td>160</td>
<td>N/A</td>
</tr>
<tr>
<td>Unity Connection – 5,000 Users</td>
<td>2*</td>
<td>6</td>
<td>200</td>
<td>N/A</td>
</tr>
<tr>
<td>Unity Connection – 10,000 Users</td>
<td>4*</td>
<td>6</td>
<td>2 x 146</td>
<td>N/A</td>
</tr>
<tr>
<td>Unity Connection – 20,000 Users</td>
<td>7*</td>
<td>8</td>
<td>2 x 300</td>
<td>N/A</td>
</tr>
<tr>
<td>Unified Presence – 1,000 Users</td>
<td>1</td>
<td>3</td>
<td>80</td>
<td>800</td>
</tr>
<tr>
<td>Unified Presence – 2,500 Users</td>
<td>2</td>
<td>4</td>
<td>80</td>
<td>2000</td>
</tr>
<tr>
<td>Unified Presence – 5,000 Users</td>
<td>4</td>
<td>6</td>
<td>2 x 80</td>
<td>4000</td>
</tr>
<tr>
<td>CER – 20,000 Users</td>
<td>1</td>
<td>4</td>
<td>80</td>
<td>800</td>
</tr>
<tr>
<td>CER – 30,000 Users</td>
<td>2</td>
<td>6</td>
<td>2 x 80</td>
<td>3600</td>
</tr>
<tr>
<td>Session Manager – 40 CPS</td>
<td>2</td>
<td>6</td>
<td>2 x 80</td>
<td>3600</td>
</tr>
<tr>
<td>Session Manager – 50 CPS</td>
<td>4</td>
<td>6</td>
<td>2 x 80</td>
<td>7200</td>
</tr>
</tbody>
</table>

*Cisco Unity Connection requires 1:1 mapping of physical CPU core to vCPU and ESXi must have a free CPU core.
## Datacenter Application

<table>
<thead>
<tr>
<th>Application</th>
<th>vCPU</th>
<th>RAM (GB)</th>
<th>HD (GB)</th>
<th>CPU RESV (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCenter App – 300 Hosts</td>
<td>4</td>
<td>8</td>
<td>10</td>
<td>N/A</td>
</tr>
<tr>
<td>vCenter DB – 300 Hosts</td>
<td>2</td>
<td>4</td>
<td>10</td>
<td>N/A</td>
</tr>
<tr>
<td>HCM App</td>
<td>4</td>
<td>4</td>
<td>80</td>
<td>N/A</td>
</tr>
<tr>
<td>HCM DB</td>
<td>2</td>
<td>4</td>
<td>160</td>
<td>N/A</td>
</tr>
<tr>
<td>Nexus 1000v – 64 Hosts</td>
<td>4</td>
<td>2</td>
<td>10</td>
<td>N/A</td>
</tr>
<tr>
<td>DCNM for SAN – 5,000 MDS ports</td>
<td>2</td>
<td>4</td>
<td>15</td>
<td>N/A</td>
</tr>
<tr>
<td>DCNM for LAN – 50 Nexus Switches</td>
<td>2</td>
<td>6</td>
<td>60</td>
<td>N/A</td>
</tr>
<tr>
<td>OM/SM – 1,000 Users</td>
<td>1</td>
<td>3</td>
<td>50</td>
<td>2048</td>
</tr>
<tr>
<td>OM/SM – 10,000 Users</td>
<td>4</td>
<td>8</td>
<td>100</td>
<td>8192</td>
</tr>
<tr>
<td>OM/SM – 45,000 Users</td>
<td>8</td>
<td>16</td>
<td>150</td>
<td>16384</td>
</tr>
<tr>
<td>VOSS – 6,000 Users</td>
<td>8</td>
<td>8</td>
<td>100</td>
<td>N/A</td>
</tr>
<tr>
<td>VOSS – 10,000 Users</td>
<td>8</td>
<td>12</td>
<td>150</td>
<td>N/A</td>
</tr>
<tr>
<td>VOSS – 50,000 Users</td>
<td>8</td>
<td>32</td>
<td>200</td>
<td>N/A</td>
</tr>
<tr>
<td>VOSS – 100,000 Users</td>
<td>8</td>
<td>38</td>
<td>300</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Application Distribution Overview

• CUCM
  B200 = 35 Instances
  B230 = 34 Instances (Less density)

• UCxN
  B200 = 9 Instances
  B230 = 15 Instances (66% Greater Density than B200)

• Blade configuration and application size will affect density
  CUCM/CUP density based on MHz
  UCxN density based on physical cores
  DC Space vs. Cost per VM (HW vs size)
  Higher User OVAs are typically more efficient

• CPU or RAM are important parameters for resource calculation
User-VM Sizing Example

- 100,000 total users
- Based on B200 M2 2.66Mhz 6 core CPU Blades
- Assume 20% Fdn / 60% Std / 20% Premium (2 endpoints per user)
- Includes the resources for management applications

<table>
<thead>
<tr>
<th>Number of Customers</th>
<th>Number of Chassis</th>
<th>Number of Blades</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 (500 user customers)</td>
<td>10</td>
<td>80</td>
</tr>
<tr>
<td>100 (1000 user customers)</td>
<td>7</td>
<td>52</td>
</tr>
<tr>
<td>20 (5000 user customers)</td>
<td>6</td>
<td>46</td>
</tr>
<tr>
<td>10 (10000 user customers)</td>
<td>5</td>
<td>40</td>
</tr>
</tbody>
</table>
Hosted Collaboration Solution

Resilient Network Architecture
HCS Datacenter Architecture

- **UCS B-Series**
- **Nexus 1000V – Virtual Switches**
- **SAN Storage**
- **MDS SAN Switch**
- **ASA**
- **ASR 1000**
- **MPLS Core**
- **DC 1**
- **DC 2**
- **DC n**
HCS and Vblock

- HCS 8.6.1 has 2 Vblock configurations
- 300FX
  - 4x UCS 5108 Chassis (32 blades)
  - EMC VNX5500
  - Support for 100,000 users
- 300GX
  - 8x UCS 5108 Chassis (64 blades)
  - EMC VNX5700
  - Support for 200,000 users
- 6140 Fabric Interconnects (2)
- Nexus 5548 Switches (2)
- MDS 9148 SAN Switches (2)
HCS Customer Separation

Datacenter Core & Aggr Layer

MPLS VPN Core

VRF-VLAN Mapping

Centralized Customer FW
• Firewall context per customer
• Cat6K FWSM or ASA

Firewall or SIP ALG
• CPE can provide FW and/or SIP-ALG
• Cisco ISR-G2 or ASA

NAT in Management VPN
• Required for overlapping addresses
• Performed at PE or CPE in SP NOC

Enterprise 1 Site 1

Enterprise 1 Site 2

Enterprise 2 Site 1

CUBE-SP
• Address Translation, b/w-lists
• Media anchoring for inter-customer and off-net calls, CAC, LI

Shared Management Components


SP Telephony Network (PSTN, SIP, Emergency Services, and Wireless)

Telephony Aggregation

Shielded Signaling Components

Ent 1

Ent 2

Mgmt

CUCM – UCxN - CUP
Enterprise 1 - Dedicated Instances

CUCM – UCxN - CUP
Enterprise 2 - Dedicated Instances

Shared (Extranet) Management VPN

Global VPN

Enterprise 1 VPN

Enterprise 2 VPN
HCS Telephony Architecture

Aggregation Layer

CUBE-SP (ASR 1000)

PGW

MGCP

AS5400

SS7/PRI/BRI

SIP

PSTN/SIP Network

Service Provider Network

Mobile Network

Emergency Services

Customer Premise (CPE)

Cust A

Cust B

Cust C

Law Enforcement Agency
HCS Dial Plan and Call Flows

![Diagram of HCS Dial Plan and Call Flows]

- **PGW**
- **CUBE-SP (ASR 1000)**
- **AS5400**
- **PSTN/SIP Network**
- **Service Provider Network**
- **Mobile Network**
- **Emergency Services**
- **HCS WAN**
- **Cust A**
- **Cust B**
- **Aggregated PSTN Calling**

**Signaling**

**Media**

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FMC with Mobile SP (via NNI SIP Trunk)

- Connect to ANY Mobile device
- Enterprise dial plan and calling policy without special client
  Same dialing policy, call barring as your desk (including ext dialing)
- Enterprise Caller-ID
  Replace mobile number with enterprise caller ID
- Single Number Reach via both Fixed or Mobile DN
  Simultaneous ring all shared-devices regardless of identity
- Seamless handoff between devices
  Seamless transition of active call between mobile and desk or soft phone
- True Single Business Voicemail
  Single voice mailbox across multiple phone numbers
- Native Message Waiting Indicator
  MWI for business voice mail
- DTMF-based Mid-Call features
  Music-on-hold, conference, transfer, call park and call move can be invoked via DTMF star codes.

Requires “customized” Mobile VPN (forced on-net) capability from mobile operator.
Customer Premise – Pure Hosted

HCS WAN Cloud

ISR G2
- SRST
- DHCP
- DSPs
- FW

SIP/H.323/QSIG

BRI/PRI

MGCP/PRI

PSTN

Mobile Network

Cisco Mobile

WLAN (802.11 a/b/g/n)

FAX

Customer Premise
Hosted Collaboration Solution

Summary
A Complete Offer from Cisco Now Available
Technology, Delivery, Commercials & Go-to-Market Combined

Cisco Collaboration
- Best in-class user experience
- Cloud-based, hybrid, on-premises
- Operational excellence in an end-to-end system

Delivery & Operations
- Fully integrated turn-key solution
- Advance Services offers a wide variety of Build, Operate, & Transfer Services

Go-to-Market Support
- New Cisco sales compensation model to incentive partner offers
- Partner Volume Discounts & Flexible Financing
Total Solution Benefits
Deliver capital and operational efficiencies on hosted platforms

- Optimization of hardware platform
- Automation from customer order to service activation
- Simplification of ongoing admin with end-customer self care
- Real-time monitoring, recovery, and platform optimization
- Scalability to millions of subscribers!

CAPEX Improvements

Before

After

OPEX Improvements

Service Orchestration
Thank you.

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