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The SIP-Enabled Organization

SIP Trunking Designs That Enhance Business Agility

Brought to you by: Verizon and Cisco
Your Presenters

Host

Jimmy Ray Purser
- Co-host TechWise TV

Panelists/Presenters

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SIP Trunking & UCC Solutions Engineer, Verizon Business

John Vickroy
Product Manager, Cisco Unified Border Element (CUBE)

Marlowe Fenne
Solutions Marketing Manager, Cisco

Darryl Sladden
Author of “SIP Trunking” by Cisco Press
• Multi-vendor Voice / PBX Interoperability
  - Getting the most value and flexibility from your current infrastructure

• Centralized, distributed, or hybrid
  - Developing an architecture to fit your business

• Maintain flexibility for current and future applications
  - Designing your SIP infrastructure for best results today and tomorrow

Visit www.ciscoverizonevent.com for prior webinars
SIP Trunking Enables Business Transformation

CONTROL COSTS
By efficiently interconnecting networks

SIMPLIFY
By streamlining and aggregating services

EXTEND
By bridging collaborative services around the globe
Multi-vendor Voice / PBX Interoperability
Multiple choice: What is your Dominant PBX architecture?

- A TDM
- B Hybrid IP/TDM
- C All IP
An all-IP, single-vendor PBX architecture has many benefits, but some customers aren’t ready to make the transition. Some common considerations:

- Has your Investment in PBX equipment been fully depreciated?
- Do you have multiple vendors to meet different applications – i.e. call center versus corporate office and branch needs?
- Have you established a corporate-wide PBX standard?
- Have you struggled to cost-justify PBX architecture refresh?

It is possible to take a multi-vendor approach, even while transitioning to SIP trunking.
Voice gateway enables transition from TDM trunks to SIP Trunks

Voice gateway (TDM-IP Voice GW) connects TDM PBX and TDM-UUCM to traditional PSTN and SP VOIP Services.
In moving from PBX to SP, an SBC is required to enable IP-IP Interoperability.
With Verizon you get a single device that provides reduced costs and complexity of TDM to IP migration.
Our solution allows for Multi-Vendor IP PBX Connect Multi-Service Trunks

Cisco UCM

Traditional PSTN

SIP H.323

TDM

IP PBX

SIP H.323

Voice GW

SIP

SP VOIP Services

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**Certification Tests**
- Verizon certifies major PBX releases directly with manufacturers
- Cisco certifies CUBE with manufacturers ([www.cisco.com/go/interoperability](http://www.cisco.com/go/interoperability))

**Interop Testing**
- Customer CPE configurations involving multiple vendors leverage certification tests
- Tested by Verizon and customer, directly through the Interop process

**The Interop Process**
- Verizon Interop Lab runs a set of rigorous testing scenarios, works with customer to resolve issues, and documents the results and final configuration in an Application Note (App Note)

**Remediation**
- After installation, performance issues are handled with a Verizon trouble ticket
- Interop App Note is used to confirm correct configuration, and works with customer to restore service
Get the benefits of SIP Trunking now

- Offerings that help organizations obtain the benefits of SIP Trunking now, while migrating to the desired voice processing end-state
  - Interop Testing
  - Professional services and consultation
  - Verizon Integrated Access (Service Provider Gateway)
  - Session Border Controller with Premise Gateway
Developing an architecture to fit your business
There are Three Basic Models of SIP Trunk Deployment

Centralized

- IP PSTN
- Enterprise IP WAN

Distributed

- IP PSTN
- Enterprise IP WAN

Hybrid

- IP PSTN
- Enterprise IP WAN
### The Centralized Model

#### Operational Benefits
- Centralizes Physical Operations
- Centralizes Dial-Peer Management
- Centralizes SIP Trunk Capacity

#### Characteristics of Centralized
- Central Site is the only location with SIP session connectivity to IP PSTN
- Voice services delivered to Branch Offices over the Enterprise IP WAN (usually MPLS)
- Media traffic hairpins through central site between SP and branches

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![Diagram of Centralized Model](image)

- **Centralized**
- **IP PSTN**
- **Enterprise IP WAN**
- **Site-SP Media**
## The Distributed Model

### Operational Benefits
- Leverages existing branch routers
- No media hairpinning thru any site
- Lower latency on voice or video
- Built-in Redundancy strategy
- Quickest transition from existing TDM

### Characteristics of Distributed
- Each site has direct connection for SIP sessions to SP
- Takes advantage of SP session pooling, if offered by SP
- Media traffic goes direct from each branch site to the SP

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![Distributed Model Diagram]

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## Benefits

- Adaptable to site specific requirements
- Optimizes BW use on Enterprise WAN
- Adaptable to regional SP issues
- Built-in redundancy strategy

## Characteristics of Hybrid

- Connection to SP SIP service is determined on a site by site basis to be either direct or routed through a regional site
- Decision to route call direct or indirect based on various criteria
- Media traffic goes direct from site to SP or hairpins through another site, depending on branch configuration

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**Diagram:**

![Diagram of Hybrid Model](image)
Polling Question

• **What type of SIP Trunking Architecture are you considering?**
  - A Centralized
  - B Distributed
  - C Hybrid
  - D Unknown
There are a few challenges in transitioning to a Centralized SIP Model.

**Distributed TDM Trunks:**
- TDM Circuit at each site
- TDM Gateway at each site

**Centralized SIP Trunks:**
- SIP sessions to IP-PSTN from central site only
- Enterprise WAN carries voice to remote sites
These challenges can be simplified using the Distributed Model.

Distributed TDM Trunks

Distributed SIP model works best when SP service allows for SIP session pooling.

- TDM Circuits to SP
- SIP Trunks to SP
So which model fits your business?

<table>
<thead>
<tr>
<th>Customer Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Distributed</strong></td>
</tr>
<tr>
<td>• Large Retailer</td>
</tr>
<tr>
<td>• 1000+ locations</td>
</tr>
<tr>
<td>• Distributed IP PBX network already in place</td>
</tr>
<tr>
<td>• Convenience of following the TDM model</td>
</tr>
<tr>
<td>• Reduced risk of a big change</td>
</tr>
<tr>
<td>• Decided on distributed SIP architecture</td>
</tr>
<tr>
<td><strong>Hybrid</strong></td>
</tr>
<tr>
<td>• Health Insurance Provider</td>
</tr>
<tr>
<td>• 4 primary locations, 1500 employees</td>
</tr>
<tr>
<td>• Centralized IP PBX at HQ</td>
</tr>
<tr>
<td>• 2 call centers separate from HQ system</td>
</tr>
<tr>
<td>• Decided on hybrid SIP architecture</td>
</tr>
<tr>
<td><strong>Centralized</strong></td>
</tr>
<tr>
<td>• Large Retailer</td>
</tr>
<tr>
<td>• Centralized TDM PBXs</td>
</tr>
<tr>
<td>• Multiple Servers at each location – inventory, POS, Security</td>
</tr>
<tr>
<td>• Centralized SIP architecture via CUBE, UCS Express, WAAS, Security integrated into 2945 ISR G2 at each site</td>
</tr>
</tbody>
</table>
## Selection Criteria Summary

<table>
<thead>
<tr>
<th>Selection Criteria</th>
<th>Centralized</th>
<th>Distributed</th>
<th>Hybrid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limitations on Headend Bandwidth Availability</td>
<td>Requires strong QoS strategies on Enterprise WAN</td>
<td>Not affected by Headend BW availability</td>
<td>Adaptable to BW availability</td>
</tr>
<tr>
<td>Use of Existing Distributed PBX infrastructure</td>
<td>Not Recommended</td>
<td>Preferred</td>
<td>Allowable</td>
</tr>
<tr>
<td>Variability of branch office service requirements</td>
<td>Recommended with uniform and simple branch office requirements</td>
<td>Recommended with uniform but complex branch requirements</td>
<td>Optimal when branch requirements are variable</td>
</tr>
<tr>
<td>Variability of branch office capacity requirements</td>
<td>Optimal when branch office capacity is low (&lt;20% of trunks)</td>
<td>Optimal when branch office capacity is high (&gt;50% of trunks)</td>
<td>Optimal when branch office capacity is high but varies from site to site</td>
</tr>
<tr>
<td>Video conferencing / Video telephony requirements thru Service Provider</td>
<td>Requires strong QoS strategies on Enterprise WAN</td>
<td>Requires adequate BW at each site. Provides flexibility in phased deployment</td>
<td></td>
</tr>
<tr>
<td>Desire / Need to Maintain branch site IT functions</td>
<td>Allowable</td>
<td>Recommended</td>
<td>Allowable</td>
</tr>
<tr>
<td>Maintain consistent latency across voice network</td>
<td>Inconsistent latency can occur</td>
<td>Recommended</td>
<td>Recommended</td>
</tr>
<tr>
<td>Degree of Centralized services (voicemail, conferencing)</td>
<td>Optimal if Branches have minimal IT infrastructure elements.</td>
<td>Optimal if Branches support IT infrastructure elements.</td>
<td></td>
</tr>
<tr>
<td>Data Center strategy</td>
<td>Optimal if Branches have minimal IT infrastructure elements.</td>
<td>Optimal if Branches support IT infrastructure elements.</td>
<td></td>
</tr>
<tr>
<td>Voice Gateway protocols for TDM access</td>
<td>If MGCP is used on TDM GW then SIP centralization may be easiest transition.</td>
<td>H323 or SIP used on TDM GW allows easy transition to SIP trunks</td>
<td>Preferred when both MGCP and H323/SIP are used on various TDM GW</td>
</tr>
<tr>
<td>Capabilities of centralized management</td>
<td>Device management may be adequate</td>
<td>Requires strong centralized management</td>
<td>Same as distributed</td>
</tr>
<tr>
<td>Standardization of branch office platforms</td>
<td>Require strong QoS &amp; CAC</td>
<td>Not a consideration</td>
<td>Requires QoS &amp; CAC</td>
</tr>
<tr>
<td>Enterprise WAN Capabilities</td>
<td>Requires TDM backup in distributed branch offices</td>
<td>Multiple SIP connection points provide survivability</td>
<td>Multiple SIP connection points provide survivability</td>
</tr>
<tr>
<td>Survivability &amp; Alternative Path Strategy</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Maintain flexibility for future applications
Polling Question

- Which services are you planning to add or enhance for branches in the next year?
  - A Security
  - B UC
  - C Video
  - D WAN Optimization
  - E Server Virtualization
  - F All of the above
Solutions enabled by SIP Trunking infrastructure – Integration Benefits

- EtherSwitch modules w/Energywise reduce power consumption
- 3G/4G WAN backup improves resilience
- Reduce bandwidth costs by processing video and voice locally
- Reduce bandwidth costs with WAAS
- Reduce virtualization costs with VMware on SRE blade
- Reduce bandwidth required for WAN backhaul with cloud security
- 3G/4G WAN backup improves resilience
- Reduce bandwidth costs with WAAS
- Consolidate UC&C infrastructure to reduce power consumption, rack space, management costs
- Consolidate UC&C infrastructure to reduce power consumption, rack space, management costs
- Reduce virtualization costs with VMware on SRE blade

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- The Retail Application business logic is centralized within the Data Center
- Primary and 3G WAN connections allow high availability in branches
- Cisco ISR runs PCI-based security as well as UC voice services
- WAAS runs as module in ISR, a external appliance or as a software service on store computers
- Wired and wireless design based on Connected Retail Reference Designs
### Large Department Store with 340 locations

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Centralized TDM PBXs</td>
<td>• Centralized SIP architecture via CUBE, UCS Express, WAAS, Security integrated into 2945 ISR G2 at each site</td>
</tr>
<tr>
<td>• Multiple servers at each location – inventory, POS, security</td>
<td></td>
</tr>
</tbody>
</table>

### Large Regional Bank with 160 branches

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Distributed TDM PBX and Key Systems</td>
<td>• Security, distributed voice and applications integrated into 3945 ISR G2 at each site</td>
</tr>
<tr>
<td>• Multiple servers and security appliances at each branch</td>
<td></td>
</tr>
</tbody>
</table>
## Range of Branch Services - Continuously Growing Portfolio of Integrated Services

<table>
<thead>
<tr>
<th>Network and Security Services</th>
<th>Collaboration Services</th>
<th>Compute Services and Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Network Services</strong></td>
<td><strong>Network and Physical Security</strong></td>
<td><strong>Unified Communications</strong></td>
</tr>
<tr>
<td>Control, Accelerate, Analyze</td>
<td>Secure, Protect, Comply</td>
<td>Reach, Communicate, Collaborate,</td>
</tr>
<tr>
<td><strong>Network Services</strong></td>
<td><strong>Unified Communications</strong></td>
<td><strong>Application Infrastructure</strong></td>
</tr>
<tr>
<td>Wireless LAN Controller (WLC)</td>
<td>Cisco Unity Express (voicemail, IVR, auto-attendant)</td>
<td>Consolidate, Improve, Protect Investment</td>
</tr>
<tr>
<td>Infoblox Network Services (AXP)</td>
<td>Cisco Unified Border Element (CUBE)</td>
<td></td>
</tr>
<tr>
<td>Cisco Network Analysis (NAM)</td>
<td>NICE Voice Recording (AXP)</td>
<td></td>
</tr>
<tr>
<td>Cisco Wide Area Application Services (WAAS)</td>
<td>Sagem-Interstar Fax over IP (AXP)</td>
<td></td>
</tr>
<tr>
<td>NetScout Network Monitoring (AXP)</td>
<td>Singlewire InformaCast Paging over IP (AXP)</td>
<td></td>
</tr>
<tr>
<td><strong>Collaboration Services</strong></td>
<td><strong>Application Infrastructure</strong></td>
<td><strong>Industry Applications</strong></td>
</tr>
<tr>
<td><strong>Collaboration Services</strong></td>
<td><strong>Application Infrastructure</strong></td>
<td>Deliver Value-add Custom Solutions</td>
</tr>
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<td><strong>Application Infrastructure</strong></td>
<td></td>
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<td>Reach, Communicate, Collaborate,</td>
<td>consolidated, Improve, Protect Investment</td>
<td></td>
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<td><strong>Industry Applications</strong></td>
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<td></td>
</tr>
</tbody>
</table>

- Medical Data Exchange (AXP)
- Orion Health Rhapsody Connect (AXP)
- Riverbed SkipWare (AXP)

*Scheduled Availability in 2012*
Optimize your return on investment by delivering Integrated Collaboration Architecture

<table>
<thead>
<tr>
<th>Verizon</th>
<th>Cisco</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 10 years planning, executing and managing converged voice solutions</td>
<td>• Integrate multiple network services to manage OpEx</td>
</tr>
<tr>
<td>• Premise/Managed and Cloud/Hosted UC&amp;C Delivery Options</td>
<td>• Complete portfolio with pre-tested, validated designs</td>
</tr>
<tr>
<td>• SIP / IP Network Provider around the globe</td>
<td>• Consolidated branch infrastructure on ISR G2 – SIP Trunking, UC, security, mobility, WAN optimization, virtualization</td>
</tr>
<tr>
<td>• Complete spectrum of professional services and consultative expertise</td>
<td>• Borderless Networks deliver voice, video and application seamlessly, reliably, securely</td>
</tr>
</tbody>
</table>

Controls Cost

Simplifies Deployment and Infrastructure

Extends New Collaborative Applications Around the World
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  - Q/A
  - Whitepapers
  - Case Studies
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  - An Insiders Look at PCI Technologies
  - [https://www.quickbase.com/up/bd87p3uqy/g/rbcz/eh5/va/TDW132_HTM_L.html](https://www.quickbase.com/up/bd87p3uqy/g/rbcz/eh5/va/TDW132_HTM_L.html)