POWERED BY TMC

PUTTING SIP TO WORK

Sonus ARROW S3

@SIPSeminar/#SIPSeminar

Today's Agenda

9:00 - 9:30AM:	Why Make a Move to SIP
9:30 - 10:15AM:	SIP Architecture Options and Requirements
10:15 - 10:30AM:	Break
10:30 - 11:15AM:	SIP Best Practices
11:15 - 12:00PM:	The SIP Ecosystem: Open Panel Discussion with service provider, technology integrator and equipment manufacturer
12:00 - 1:00PM:	Networking Lunch

Why Make the Move to SIP

Peter Bernstein, Senior Editor

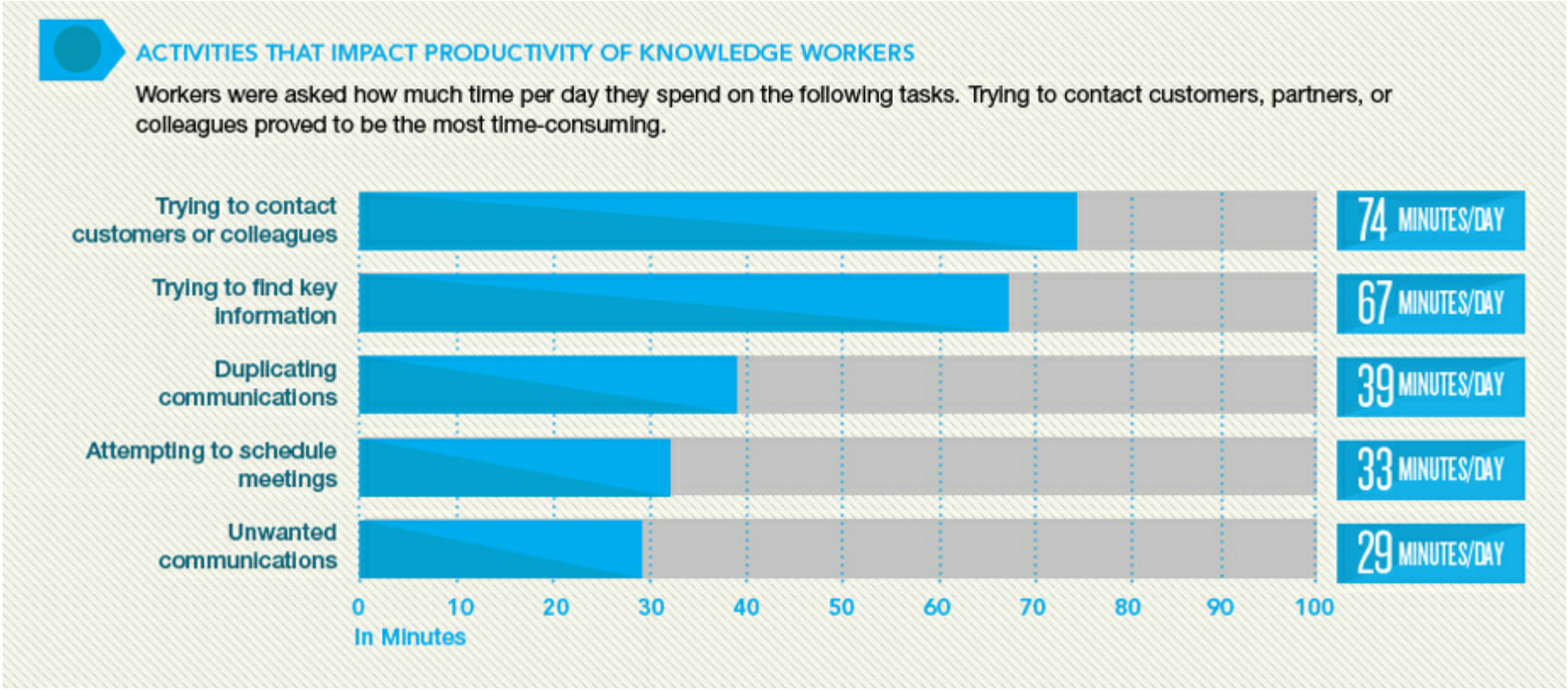

The Age of Acceleration
Business is about Speed
In the "Age of Acceleration"
Real Time is the Only Time

Age of Acceleration Formulas

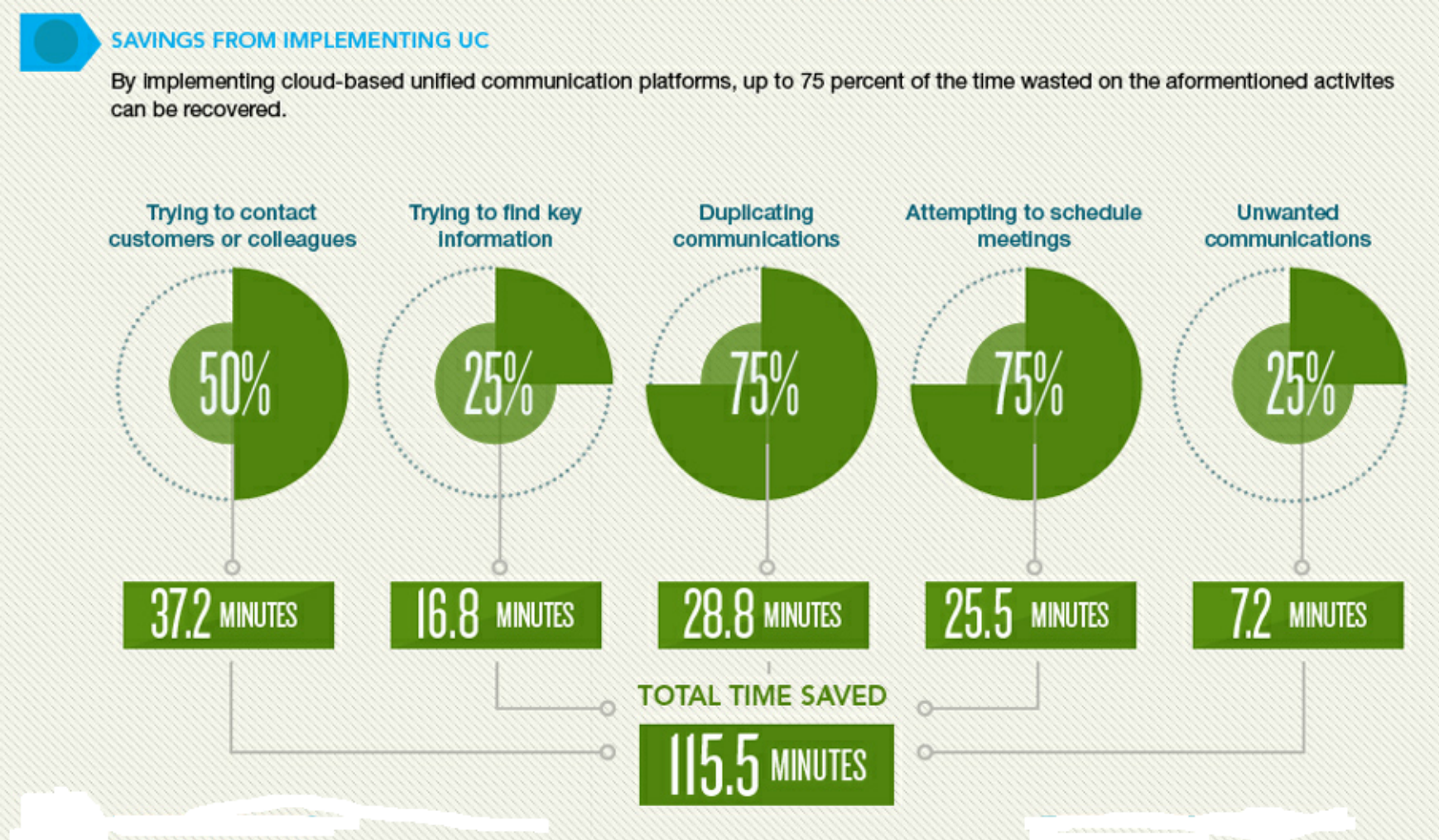
Realities

- Time = Money
- Time = Finite Resource
- People + Products & Services + Processes = Performance
- Disruption/Innovation = Opportunity
- Performance Optimization = Competitive Advantage

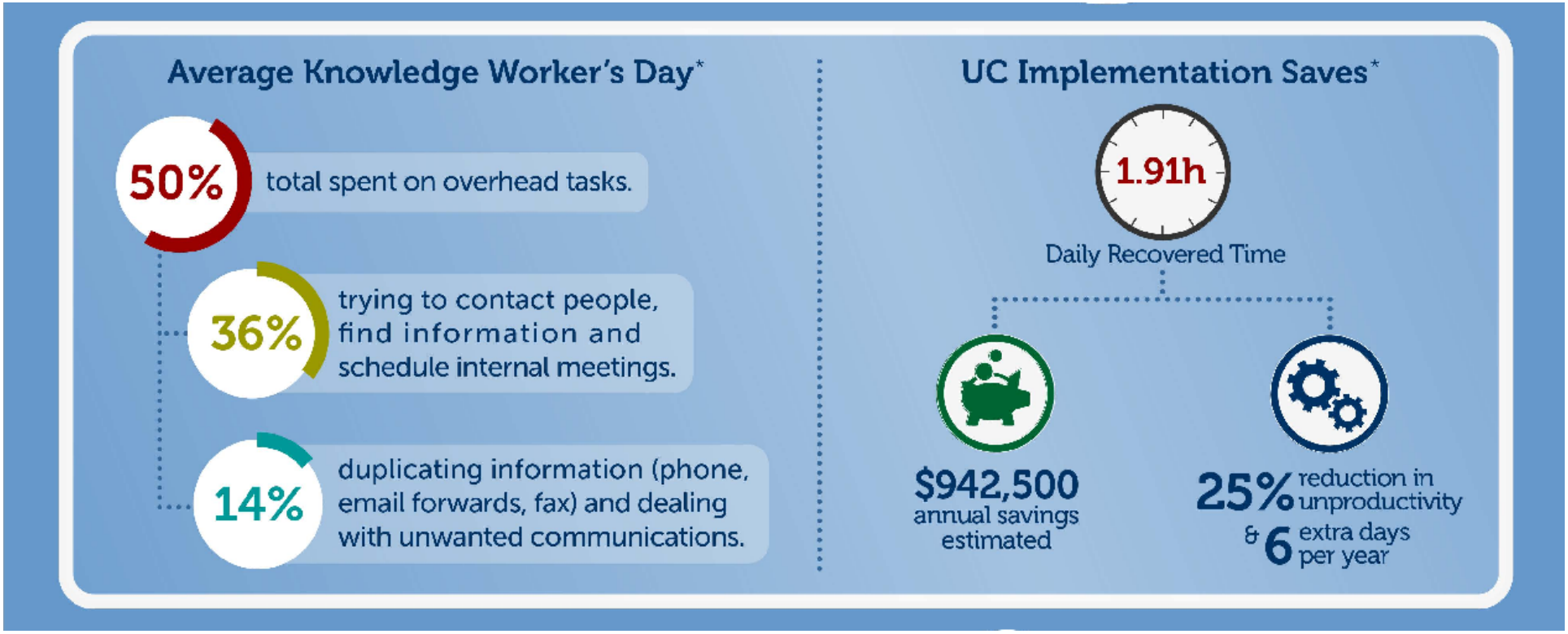
Decelerators = Lost Time



SIP and UC Save Time



Time = Money


Average Knowledge Worker's Day*
50%
total spent on overhead tasks.
36%
trying to contact people, find information and schedule internal meetings.
14%
duplicating information (phone, email forwards, fax) and dealing with unwanted communications.
UC Implementation Saves*
1.91h
Daily Recovered Time
$942,500
annual savings estimated
25% reduction in unproductivity
& 6 extra days per year

SIP Accelerator of UC

Top UC features*:	Top UC benefits**:
#1 Access to work e-mail and voicemail via smart phones (56%)	#1 Increased productivity (53%)
#2 Ability to receive voicemail messages via e-mail (46%)	#2 Reduction of operating costs (48%)
#3 Video conferencing: Ability to speak face-to-face without traveling (45%)	#3 More reliable communication of information (46%)
#4 Ability to send broadcast messages to a group via e-mail and telephone (40%)	#4 Mass emergency notification (40%)
#5 Ability to provide integrated audio/Web/video conferencing (39%)	#5 More effective use of remote/mobile workers (39%)
#6 Access to instant messaging services (38%)	#6 Better decision making (35%)

Why SIP? Why Now?

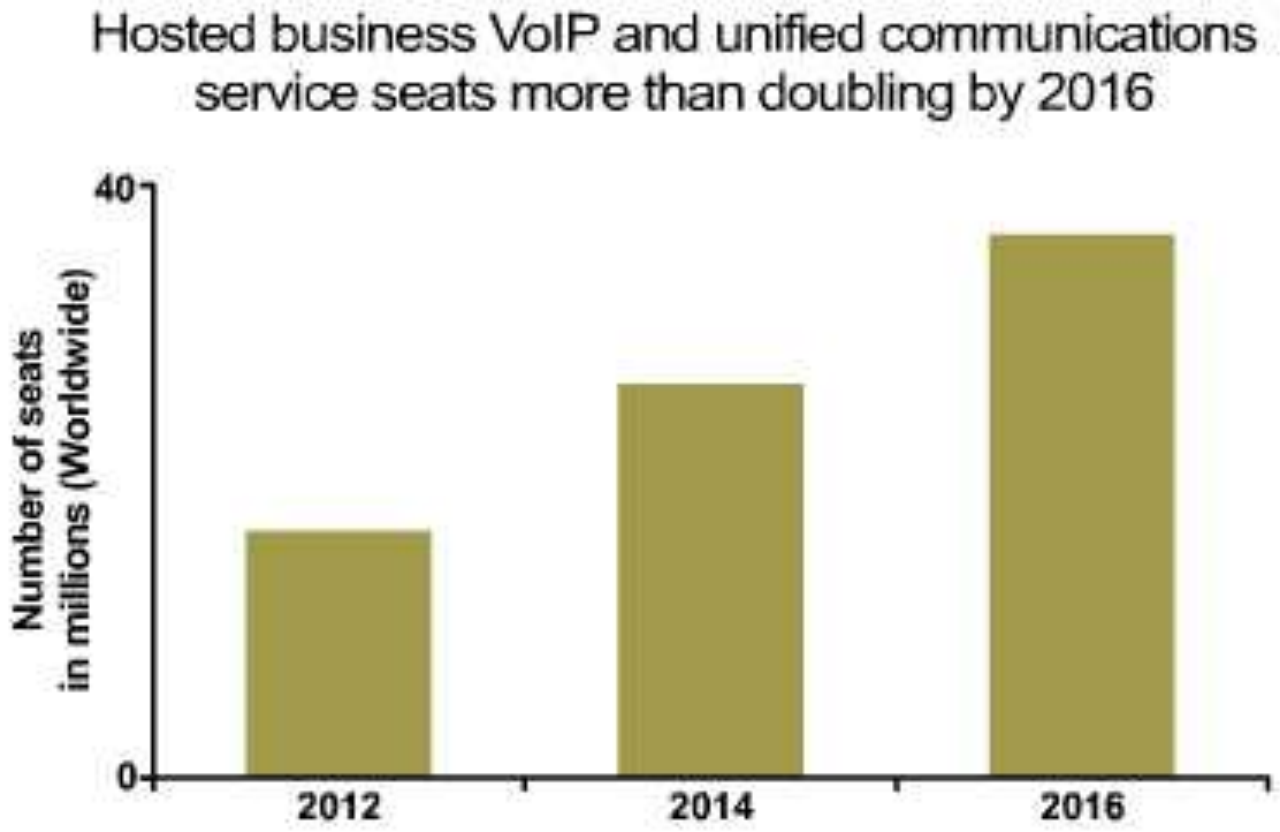
Today's companies are at the business operations and technology tipping point.

In a world where the only constant is change, your business can only perform optimally if your "Infostructure" is working for you instead of presenting obstacles.

SIP Represents A Massive Business Opportunity

Whether it's the flexible, scalable SIP infrastructure designed to properly support today's unified communications demands for mobility and BYOD or a plain and simple recipe for cutting monthly expense, now is the time to make a solid SIP decision.

SIP Services Adoption is Growing



© Infonetics Research, *VoIP and UC Services and Subscribers Biannual Worldwide and Regional Market Size, Share, and Forecasts*, March 2012

VoIP UC Services Market Highlights

Global service provider revenue from business and residential/SOHO VoIP services totaled nearly $58 billion in 2011, up 16% from the previous year.

VoIP UC Services Market Highlights

SIP trunking service revenue jumped 128% in 2011 from the previous year, as businesses adopt SIP trunking for flexibility, centralization of resources and cost effective voice connectivity.

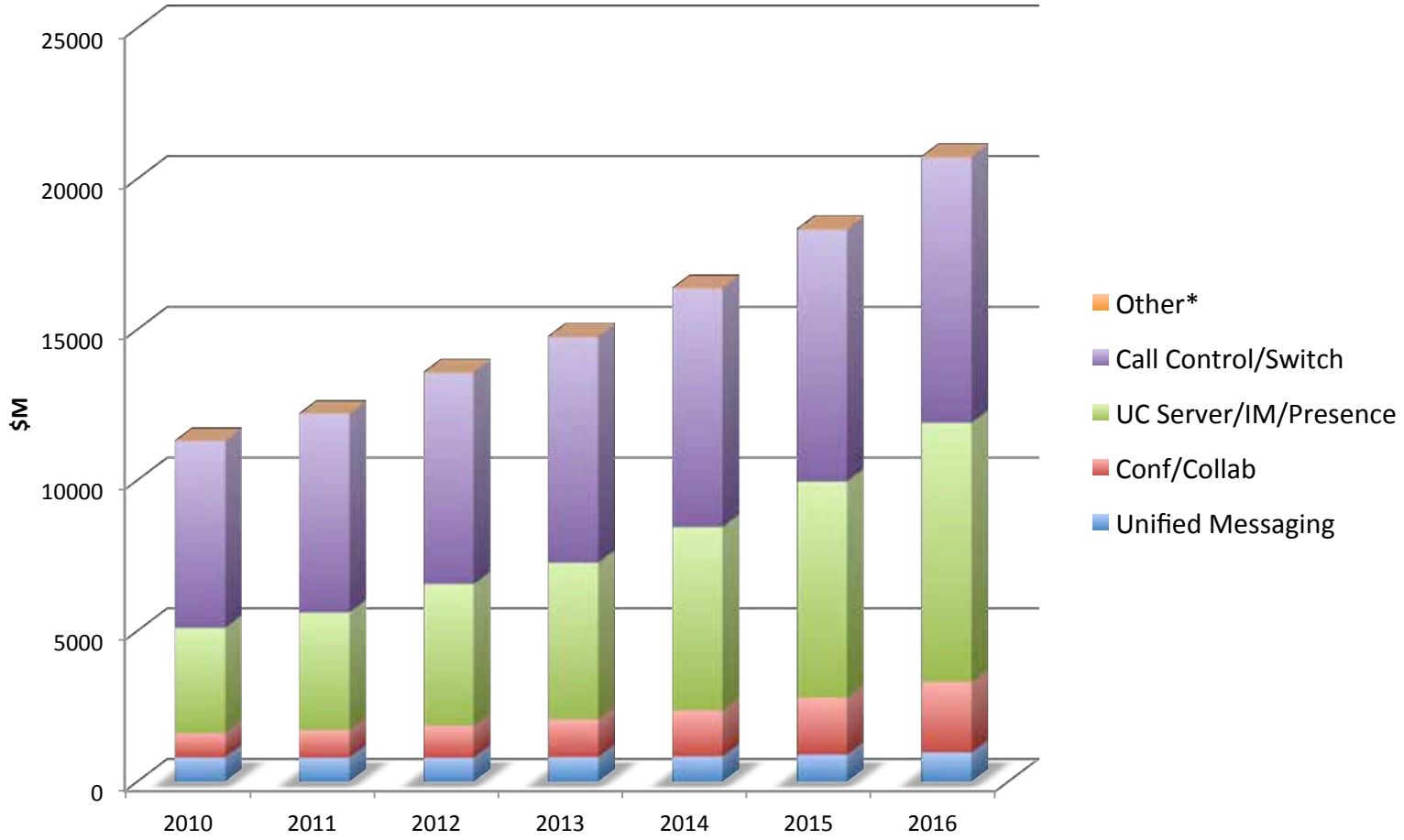
VoIP UC Services Market Highlights

Demand for cloud-based services helped push hosted PBX and UC service revenue up 33% and seats up 44% in 2011.

VoIP UC Services Market Highlights

The number of residential and SOHO VoIP subscribers grew 14% in 2011, to over 178 million worldwide, as more households opt for no fixed-line voice connection.

Total (UC Capable) UC Revenues Worldwide ($M)



Make The Move To SIP

- SIP trunking adoption growing at 50% per year.
- Enterprises of all sizes are making the move, seeking to capture up to 75% savings in traditional enterprise telecom bills and an estimated 23% increase in knowledge worker productivity.

* Source: 2012 Webtorials State of the Market Report on SIP Trunking By Sonus Networks
** Source: Infonetics

Make The Move To SIP

- Among those using SIP Trunks, significant cost savings have been realized, with an average savings on the order of 33%.*
- SIP Trunking can save up to 70% on OpEx
- In North America (NA) 42% of enterprises will use SIP trunking by 2014.**

* Source: 2012 Webtorials State of the Market Report on SIP Trunking By Sonus Networks
** Source: Infonetics

Make The Move To SIP

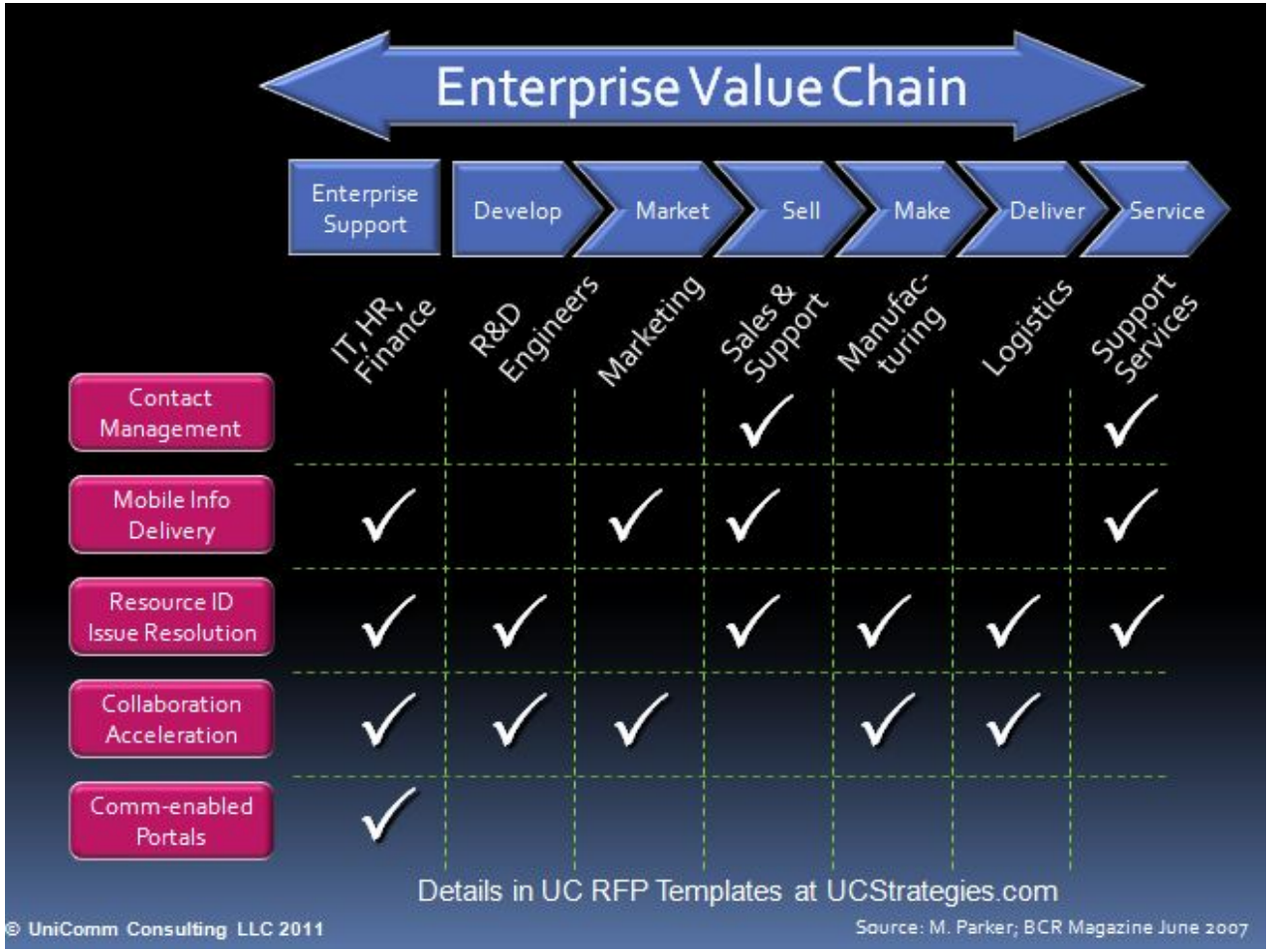
- SIP trunk adoption is primary driver for enterprise NA Session Border Controller (SBC) sales -- grew 88% in 2011 over 2010.*
- Global enterprise SBC market to grow to $527 million in 2016.*
- SBCs will eventually replace (TDM to) VoIP gateways used today.**

* Source: 2012 Webtorials State of the Market Report on SIP Trunking By Sonus Networks
** Source: Infonetics

SIP Enables Your Day-to-Day Communication (UC) With Ease

- Instant Messaging
- Mobility Integration
- Presence (contact status)
- Simplified Addressing
- Multimedia Collaboration
- Video
- Voice over IP (VoIP)
- Interoperability

How, Where and Why SIP-Enabled UC and BPO Fit



Challenges Of SIP Implementation

Business:

Leverage Infostructure that enables your organization to be first to market, fast in the market and best in the market.

Challenges Of SIP Implementation

Technology:

There are a variety of flavors of SIP; focus on solutions that break down internal and external communications silos.

Challenges Of SIP Implementation

Technology:

Security is critical: make sure you are working with a trusted vendor who can architect a SIP solution that enables the maximum risk management capabilities and tools you require.

Challenges Of SIP Implementation

Technology:

Develop a SIP implementation, UC and BPO plan. Ensure all parts of the enterprise are involved and that there is not just executive buy-in but also clearly defined accountabilities and responsibilities.

SIP Delivers Unmatched Results

- Ease-of-use and management
- Cloud and on-premises friendliness
- Substantial CapEx and OpEx savings
- Business process optimization
- Improved customer experiences (Int. & Ext.)
- Future-ready platform for E-everything
- Demonstrable ROI and lower TCO


SIP - Enabling the
"Age of Acceleration"
Now is the Time to Meet the Need for Speed!

PUTTING SIP TO WORK

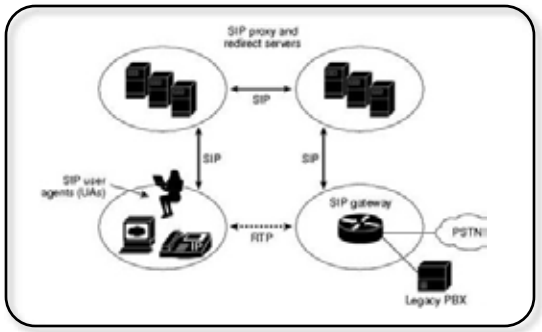
SIP Architecture Options and Requirements

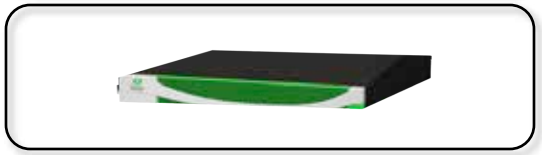
Rich Schunk, Senior Systems Engineer

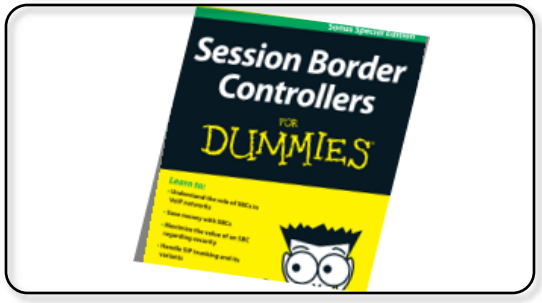
Sonus®

Topics for Discussion

- Components of a SIP Network
  - User Agents, Redirectors, Proxy Servers
  - Back to Back User Agent: Session Border Controller
  - SIP Proxy Server: Session Management
- The Role of the SBC in the Enterprise
  - What it does
  - SBC functions needed today to serve the enterprise
- Enterprises Challenges and How SIP Can Help
  - Migration to SIP – TDM
  - Migration to SIP – H.323
  - Opportunity: Centralized Routing Fabric
  - Call Center Security
  - Media Inter-Working
  - Opportunity: New Apps w/Session Management
- Additional Resources
  - SBC for Dummies







Components of a SIP Network

Understanding Session Initiation Protocol

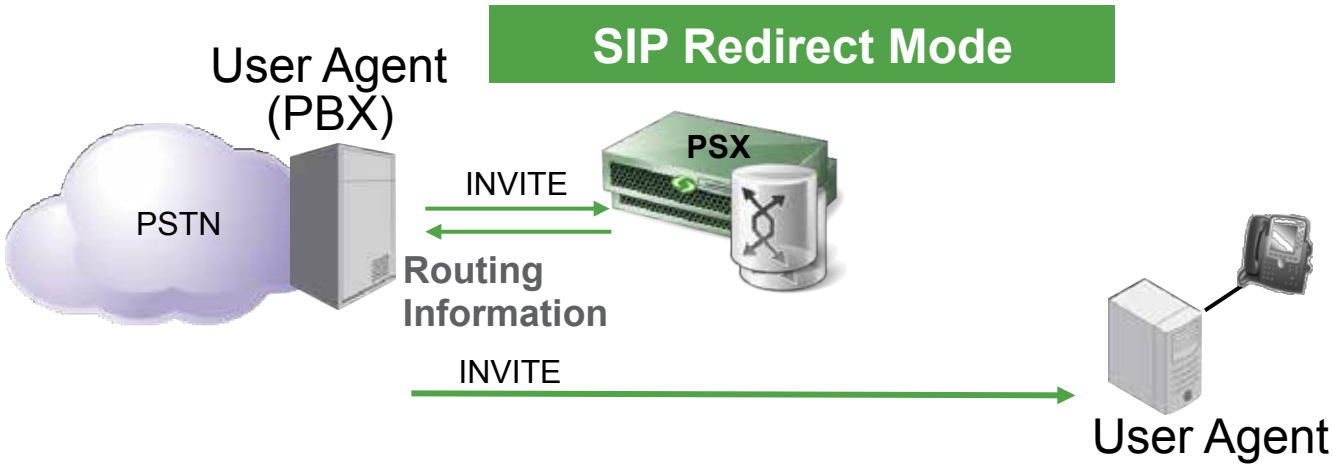
- Driven by the need to be able to explicitly invite 1 or more users to a session
- Evolved from initial work done at Columbia University
- Merging of 2 IETF protocols – Session Invitation Protocol (SIPv1) and Simple Conference Invitation Protocol (SCIP)
- SIP used to initiate the session… utilizes Session Description Protocol (SDP, RFC 4566) to describe the session
- SIP runs over UDP, TCP / TLS, SCTP
- Text-based protocol
- RFC 5411 – A Hitchhikers Guide to the Session Initiation Protocol (SIP): http://tools.ietf.org/html/rfc5411

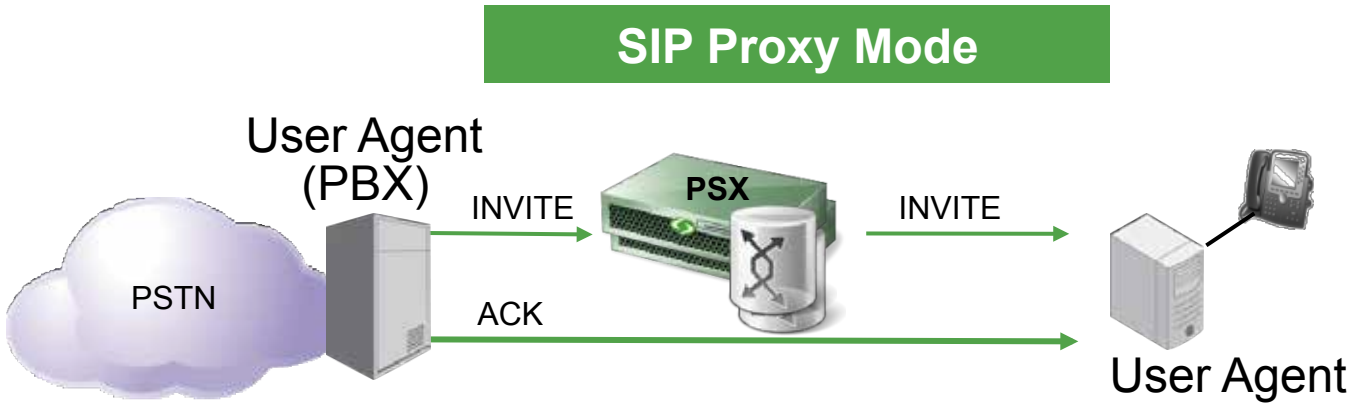
Session Based Communications

SESSION

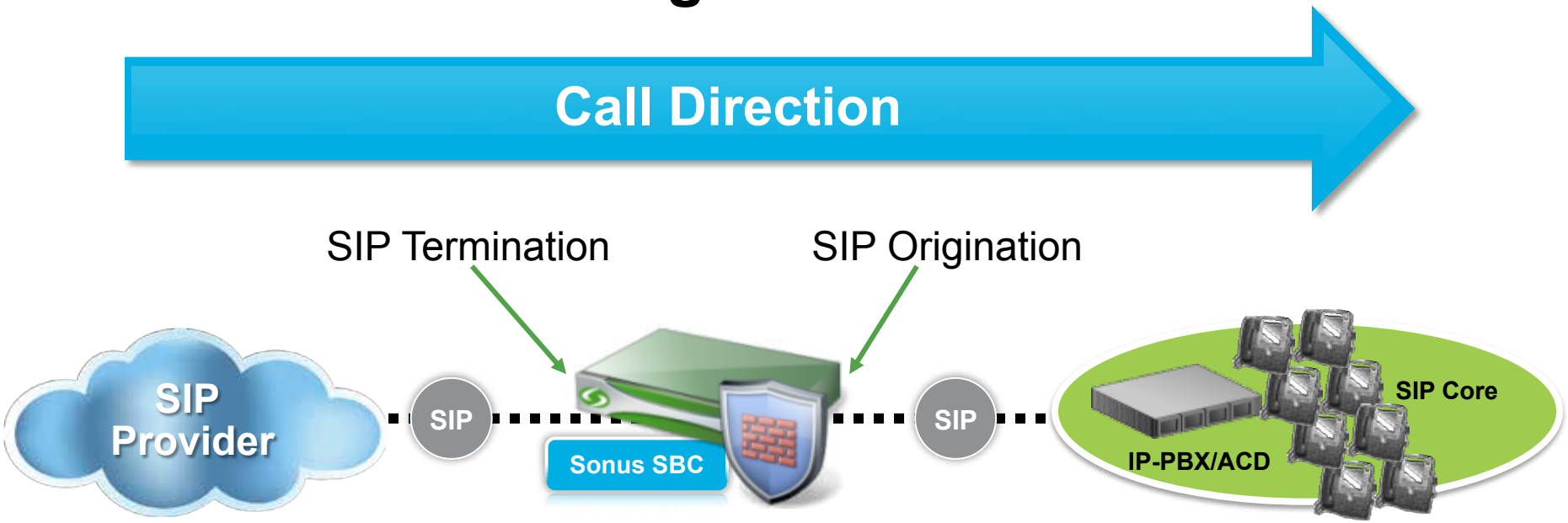
Invite	Join / New Session
Subscribe /Notify	Request Service / Notification
Register	Dynamic Service Registration

SIP User Agent (UA), SIP Redirector, Proxy



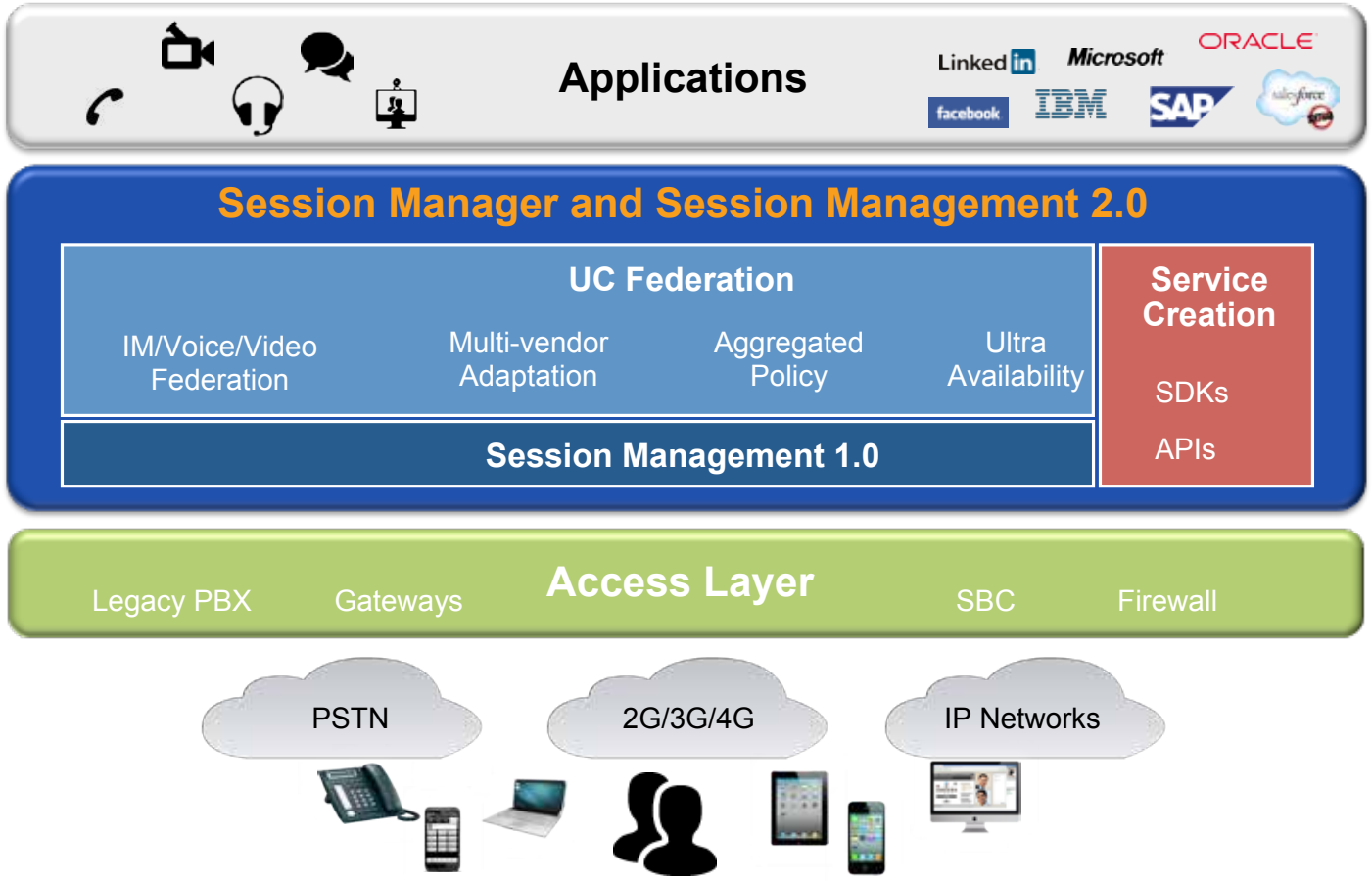


Back-to-Back User Agent – the SBC



The Session Border Controller is the communications firewall for the Enterprise

SIP Offers Centralized, Open Architecture



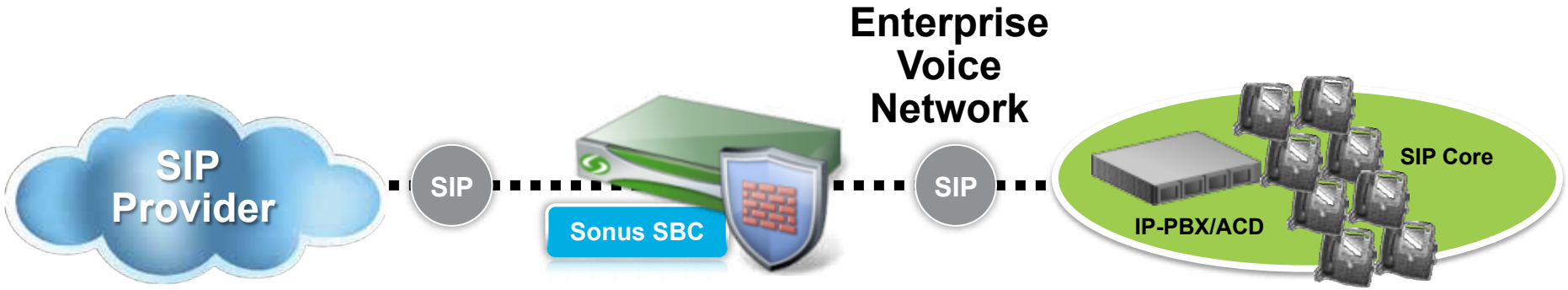
Session Management

- Provides Open, Scalable Layer Between Users and Applications
- Create Unified Communications Architecture for the Network

The Role of the SBC in the Enterprise

Why Do Enterprises Need an SBC?

SBC Sits at the Border of Each Network & Acts as a Firewall and Traffic Cop



Security

- Protect resources
- Facilitate connectivity (NAT)
- Provide media and signaling encryption

Interoperability

- Enterprises and Service Providers
- Enterprise legacy PBXs
- Protocols

Network Analytics

- Troubleshooting
- CDR collection
- Demarcation

New Services

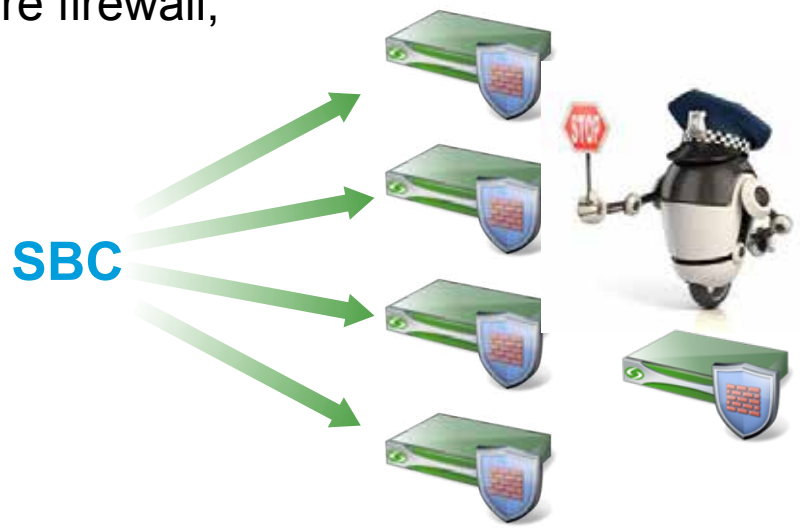
- HD Voice
- Video Services
- Cloud based Application access

Role of the Session Border Controller (SBC)?

A device inserted into the signaling and media path between devices to provide session interworking: a "Session Traffic Cop"

An SBC provides:

- Access To SIP Trunking and Enables UC
- Connectivity: NAT Transversal, session aware firewall, IPv4 to IPv6
- Security: DoS, IPSec and TLS origination and termination
- Quality of Services: Policing, rate limiting
- Media Services: CODECs, Fax, DTMF
- Protocol Normalization
- Centralized Recording
- Policy Control



The Initial SBC

Today - Small or limited deployments in a burgeoning market

Security

- Dynamic pin-holing to augment firewall
- Topology hiding

Policy

- Rate limiting
- Call admission control
- TOS/DSCP bit setting
- Basic point A to point B call flows

Connectivity

- NAT traversal
- H.323 to SIP interworking

Media

- Not required or supported; may be handled by media servers

The SBC Today & Going Forward

- **Deployments are scaling exponentially due to traffic increases in peering and access**
- **Movement from the carrier market to the enterprise market**

Security

- Dynamic Pin-holing to augment firewall
- Topology hiding
- **Protect from denial-of-service attack (DoS) or distributed DoS**
- **Protection from toll fraud via rogue media streams**
- **Malformed packet protection**
- **Encryption of signaling (via TLS and IPSec) and media (SRTP)**

Policy

- Rate limiting
- Call admission control
- TOS/DSCP bit setting
- Basic point A to point B call flows
- **Least Cost routing mechanisms that are updated continuously**
- **Dial plan management for/within enterprises**

Connectivity

- NAT traversal
- H.323 to SIP interworking
- **SIP Header Manipulation to interwork application to application**

Media

- Not required or supported; may be handled by media servers
- **Codec transcoding**
- **DTMF relay and interworking**
- **Data and fax interworking**

Enterprise Challenges and How SIP Can Help

The Desired Outcome

Cloud | Applications | Mobility | Modality

Enterprise Challenges

- Multiple Islands of Call Routing
  - Proliferation of PBXs within the corporation
  - Disparate PBX Vendors, Models, Capabilities
  - Too many touch points for routing and management
  - Disaster Recovery Challenges

- Call Centers
  - Increasing Call Volumes / Cost / Number of locations
  - Migrating TDM-centric ACDs

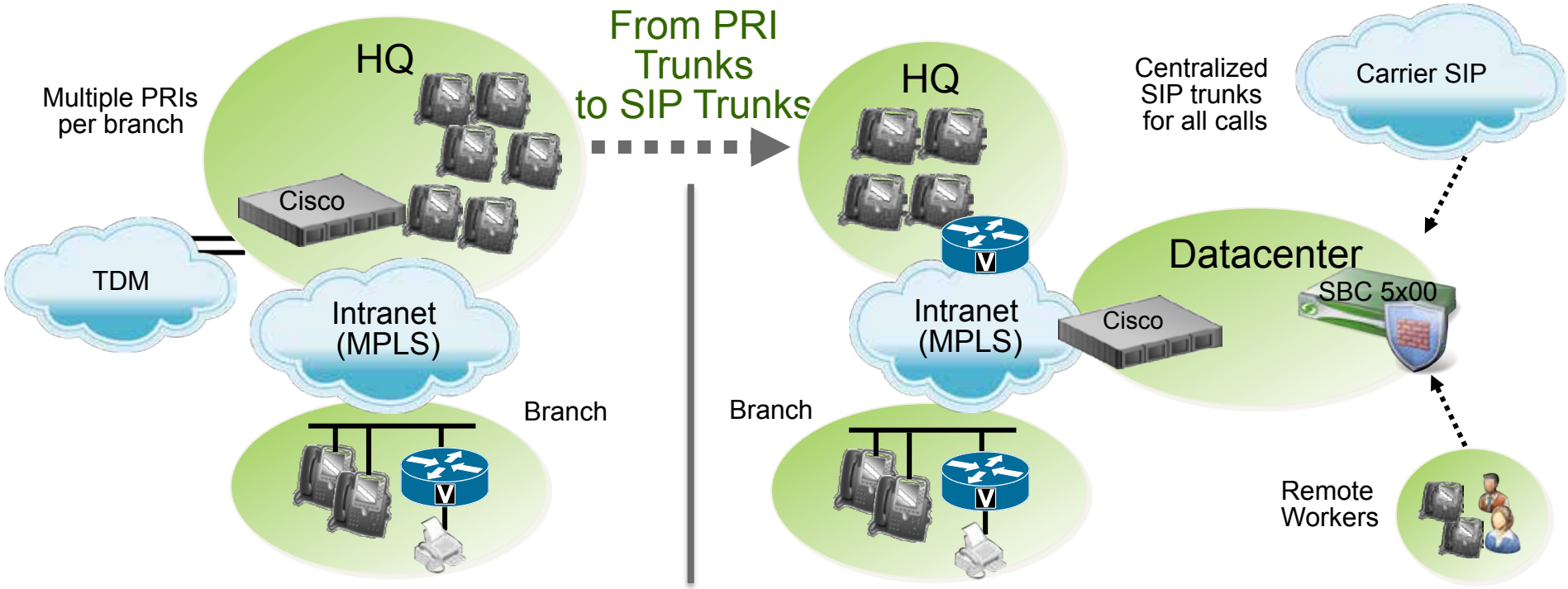
- Migration Challenges
  - Interworking of SIP and H.323
  - Introducing security into call centers

- Carrier Management
  - Multiple telecom providers
  - Not cost optimized
  - Multiple bills, feature differences

- Complexity of Introducing New Applications and Capabilities
  - How do I develop the infrastructure / how do I deploy / support?

Opportunity: Voice Network Consolidation Application

From Distributed TDM to Centralized SIP Trunking



- Limited intra-site connectivity
- Inflexible
- Services are provided to locations not users
- Every change requires carrier action MAC's
- Hard to aggregate bills
- Management challenges – many touch points
- Hard to facilitate remote workers

- Services are tied to users, not location
- Equipment can be centralized
- 70% savings on SIP Trunks
- Web-based provisioning
- Single billing solution, ability to track call performance
- Streamlined management – single routing database (PSX redirector)

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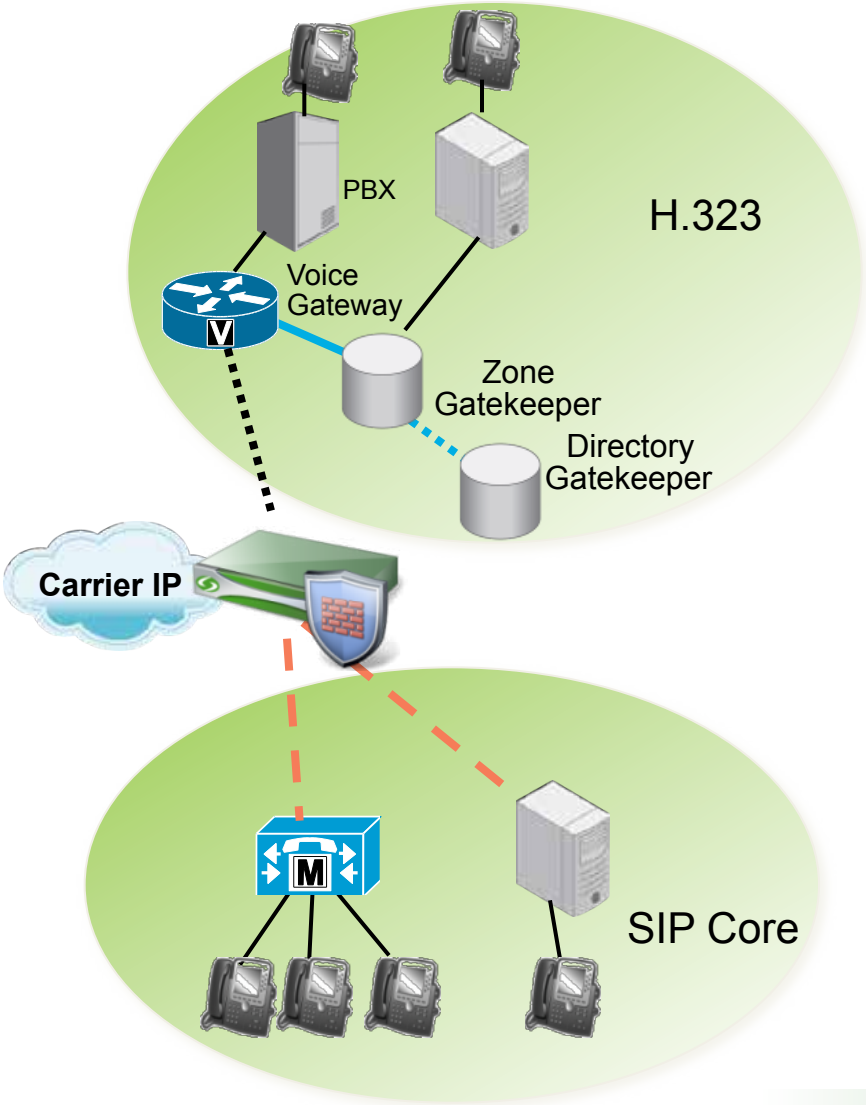
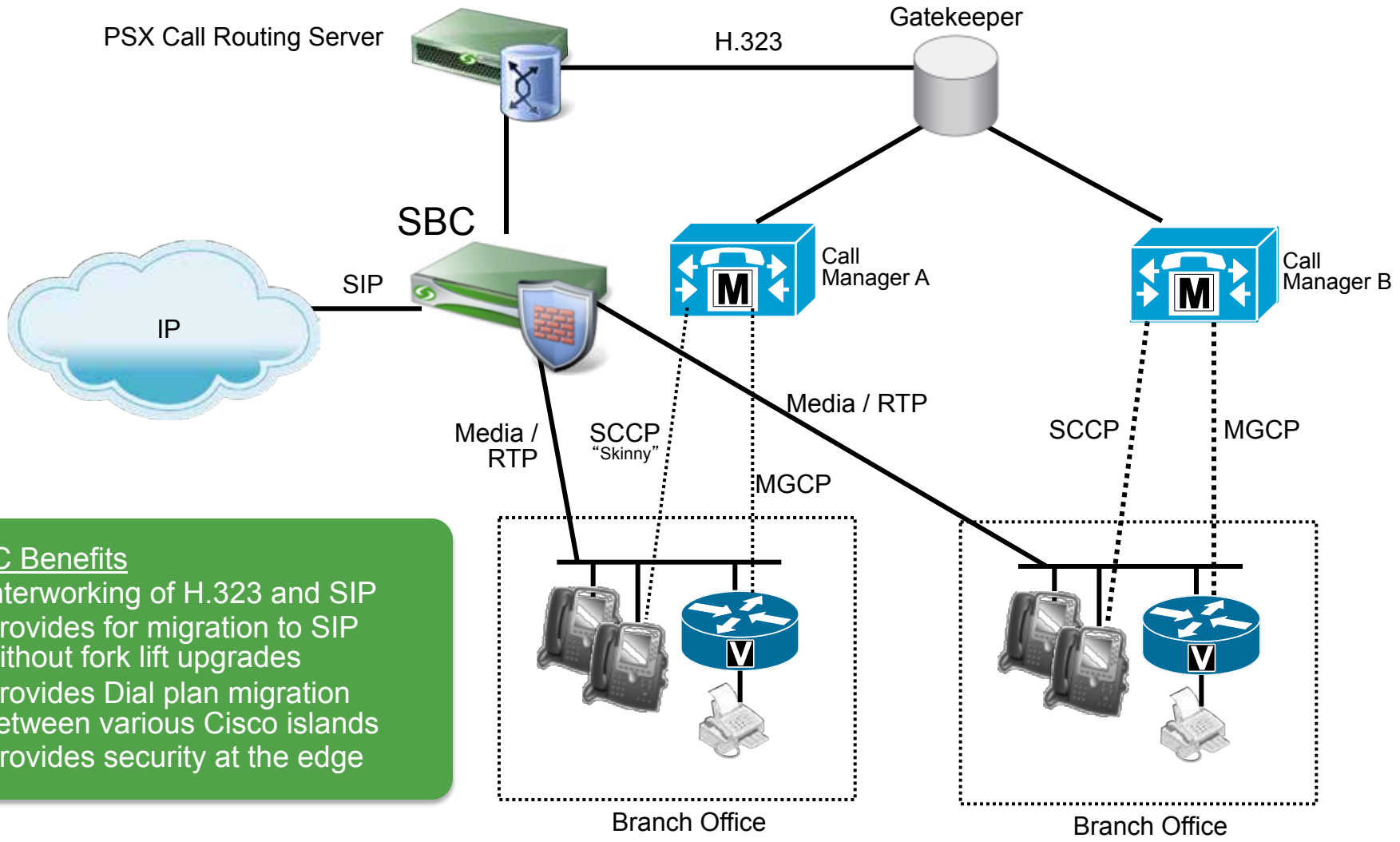
Migration of H.323 in the Enterprise



- Challenge: Many of the devices within my Enterprise are H.323
- The SBC can provide interworking for H.323 to SIP
- Provides connectivity from Enterprise to Carrier
- Provides connectivity within an Enterprise

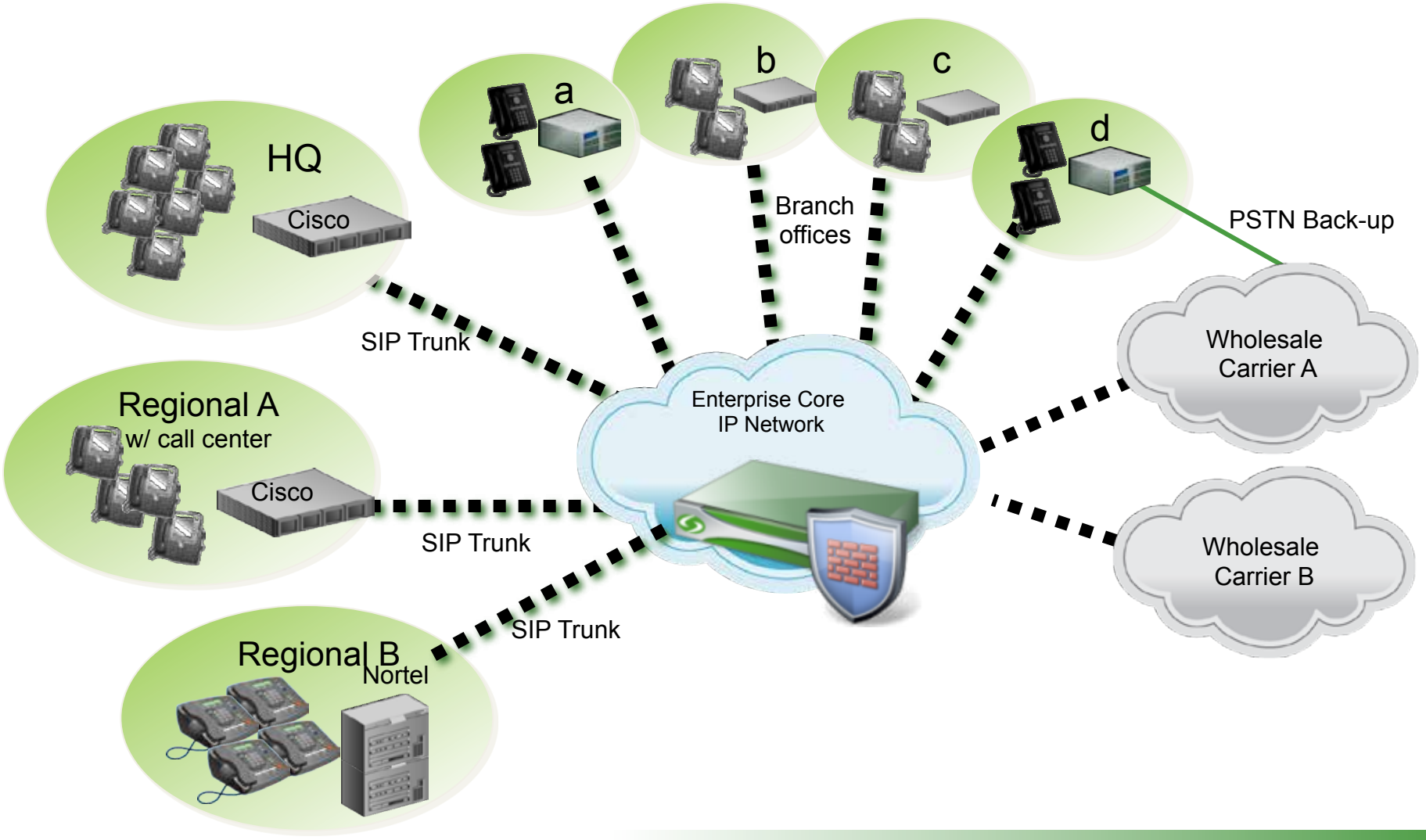
Case Study - Branch Office Application



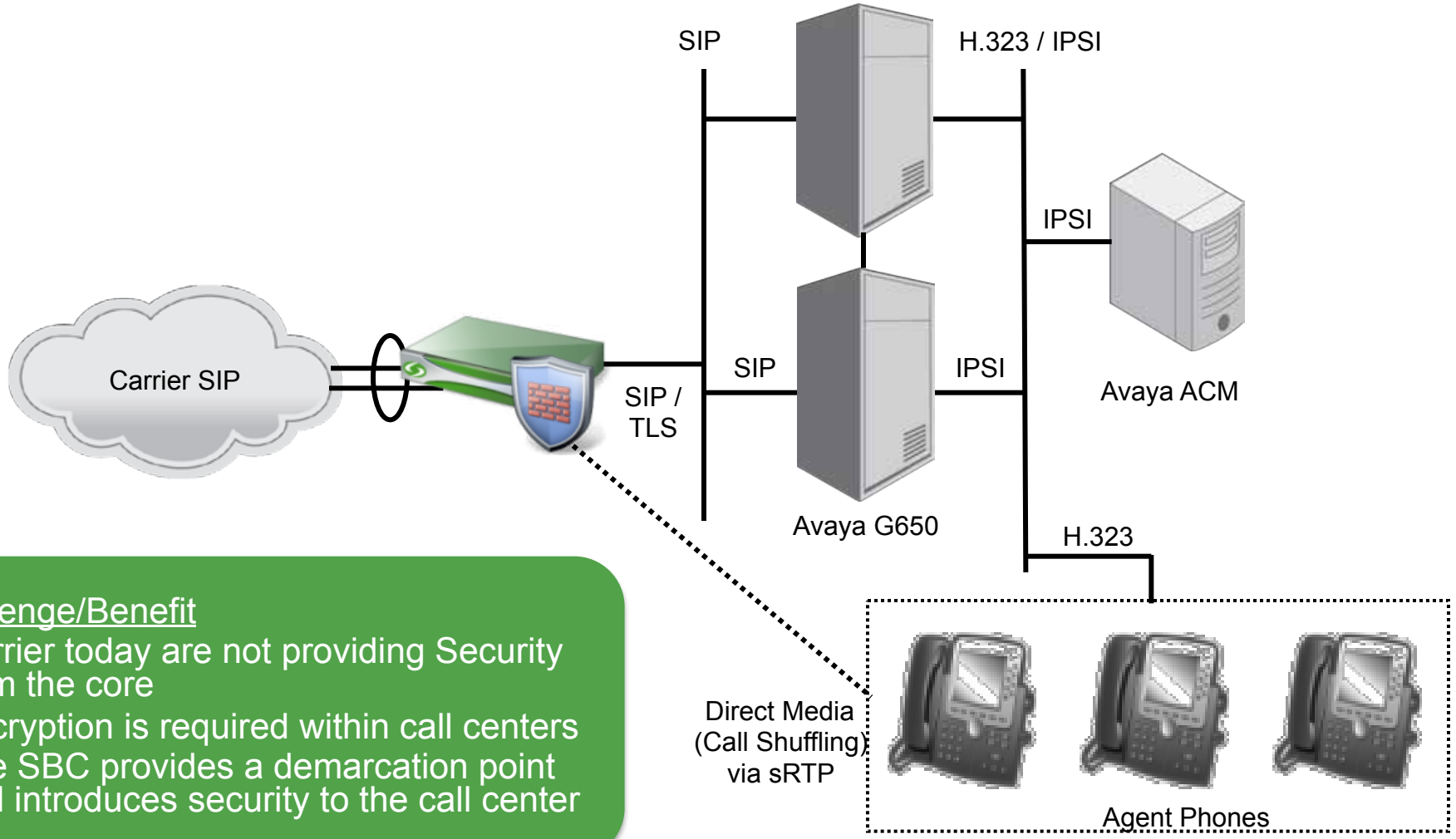
SBC Benefits

- Interworking of H.323 and SIP
- Provides for migration to SIP without fork lift upgrades
- Provides Dial plan migration between various Cisco islands
- Provides security at the edge

Opportunity: Lower network operations costs
Centralized Routing – Dial Plan Management



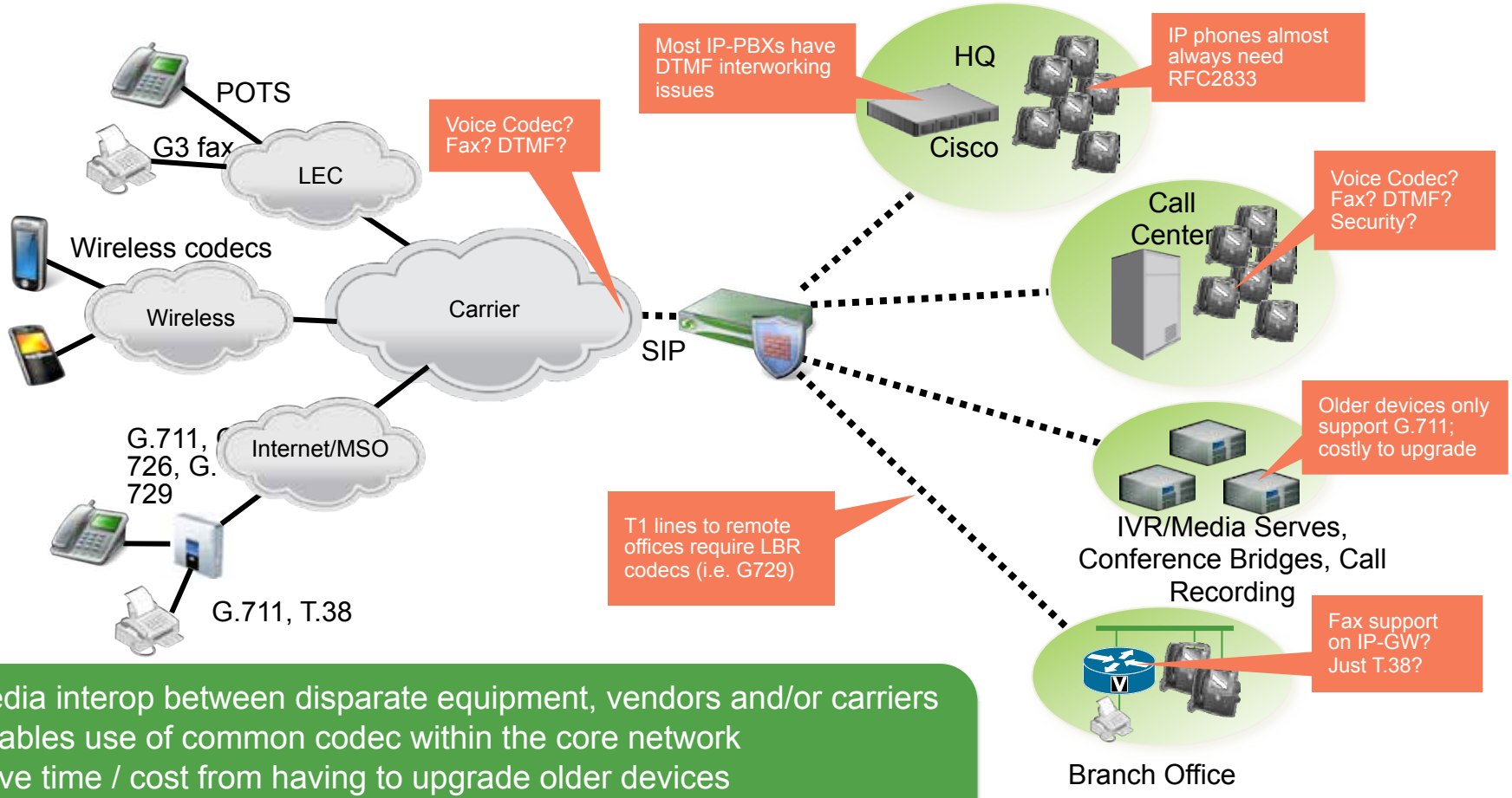
Opportunity–Introducing Call Center Security



Challenge/Benefit

- Carrier today are not providing Security from the core
- Encryption is required within call centers
- The SBC provides a demarcation point and introduces security to the call center

Media Interworking – Why do I need it?

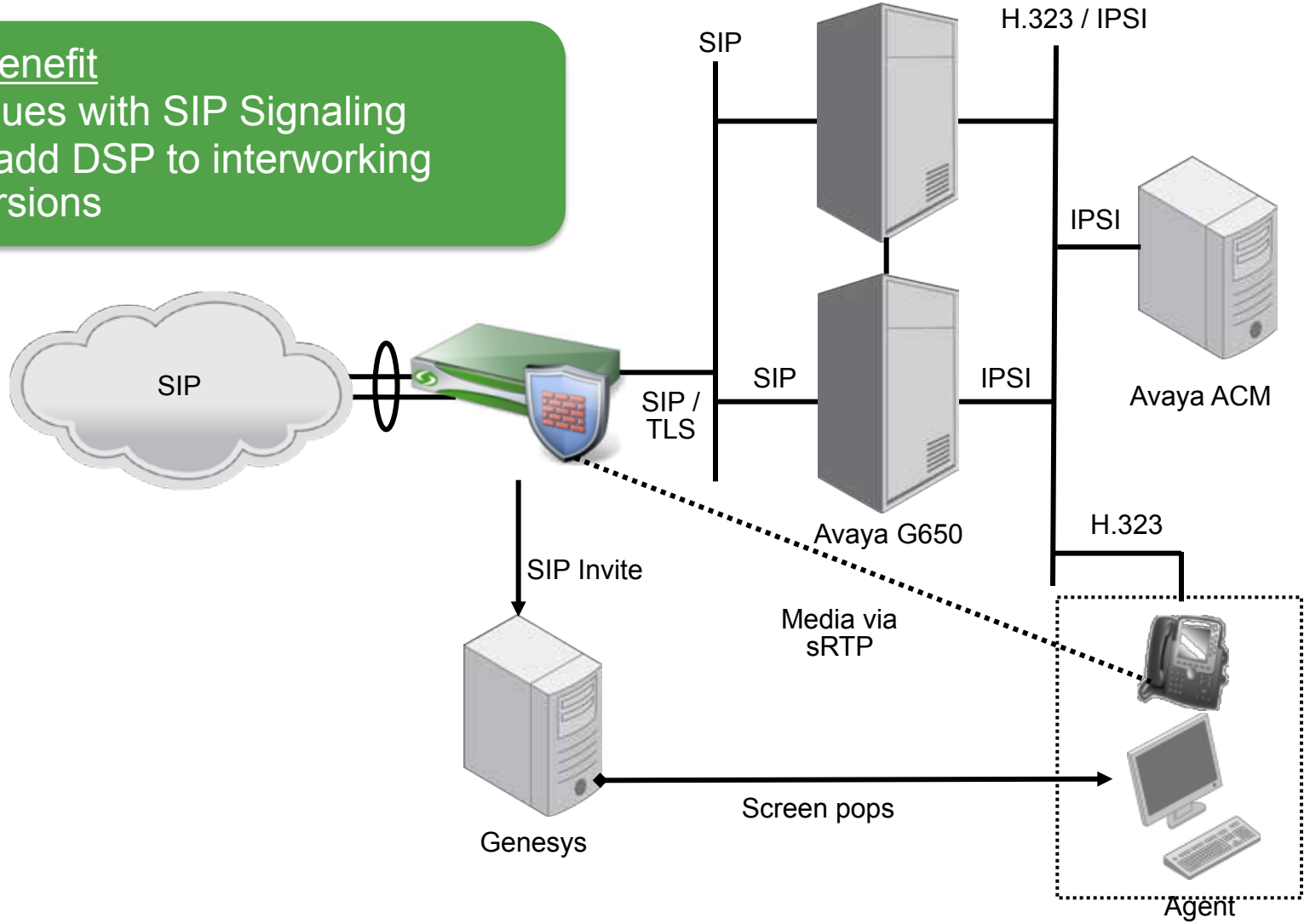


- Media interop between disparate equipment, vendors and/or carriers
- Enables use of common codec within the core network
- Save time / cost from having to upgrade older devices (IVRs, media servers, phones, etc)
- Provide fax and DTMF interworking (very common)

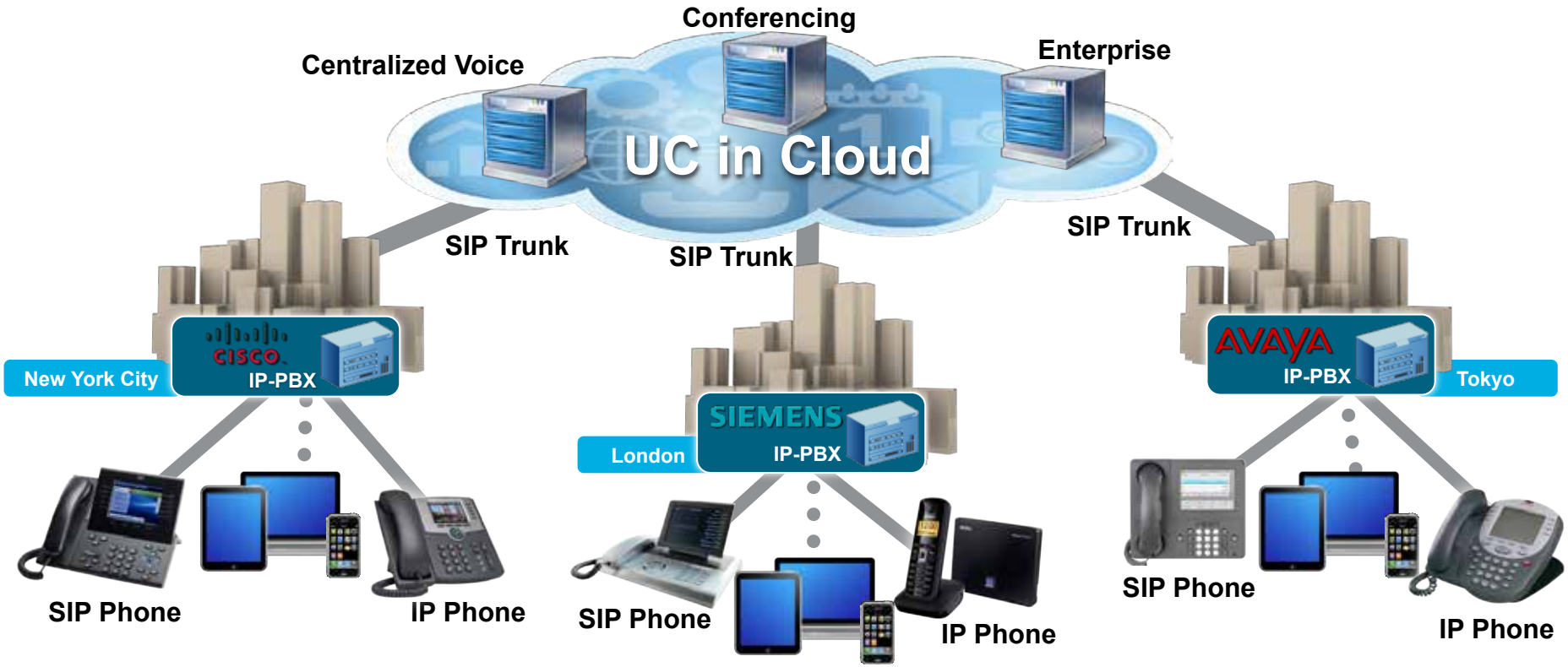
Example of Media Interworking

Challenge/Benefit

- DTMF issues with SIP Signaling
- Ability to add DSP to interworking DTMF versions



Session Management is a Key Enabler for the Enterprise



- Enables Integration Across Mixed PBX Infrastructures
- Protects and Caps Investment in PBX Infrastructure
- Integrates Mixed End Points and Customer Access
- Accelerates Adoption of UC Cloud Models

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Evolved Notion of a Session

Always Connected:
Sessions go dormant, resume, go dormant

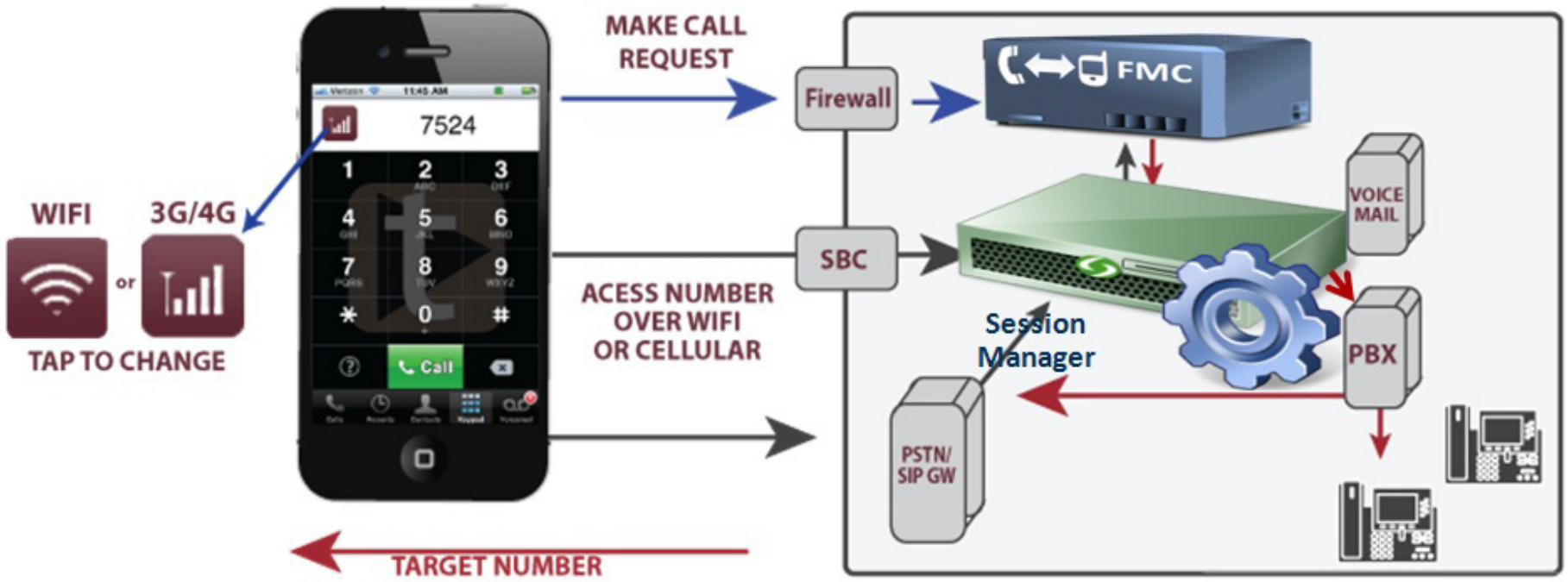
Multi-Party:
User communicates with his social group

Rich Media:
Text, images, videos, voice, files, music

Multi-Terminal:
PC, Notebook, Mobile, IP-TV

Session Mobility:
Persistence across terminals

Over The Top – Using Wi-Fi to Reduce Access Costs



Outbound Calling Over WiFi or 3G/4G

Value: Session Management

Technology

Bridge the interworking gap for heterogeneous networks with adaptations and a framework that delivers new services

Enable enterprise federation and confederation across business communities and legacy voice platforms

Normalizes SIP messages and call flows through adaptations, centralized policy enforcement and application sequencing

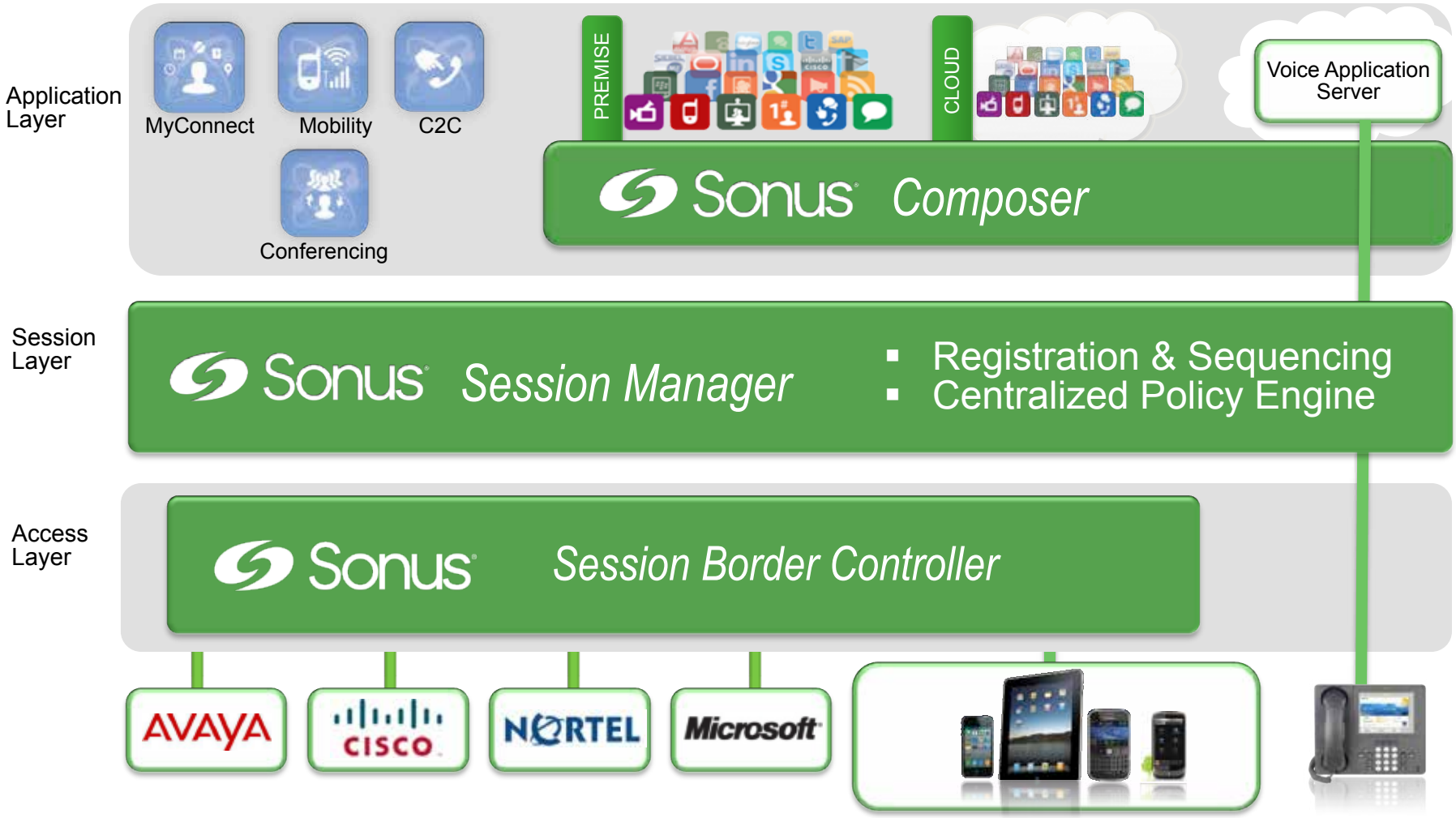
Business

Enable the implementation of advanced UC capabilities to drive network cost efficiencies and organizational productivity

Provide for a much higher level of collaboration within the enterprise

Drive the adoption of mobility, video and other collaboration services to improve customer service, employee satisfaction and knowledge worker productivity

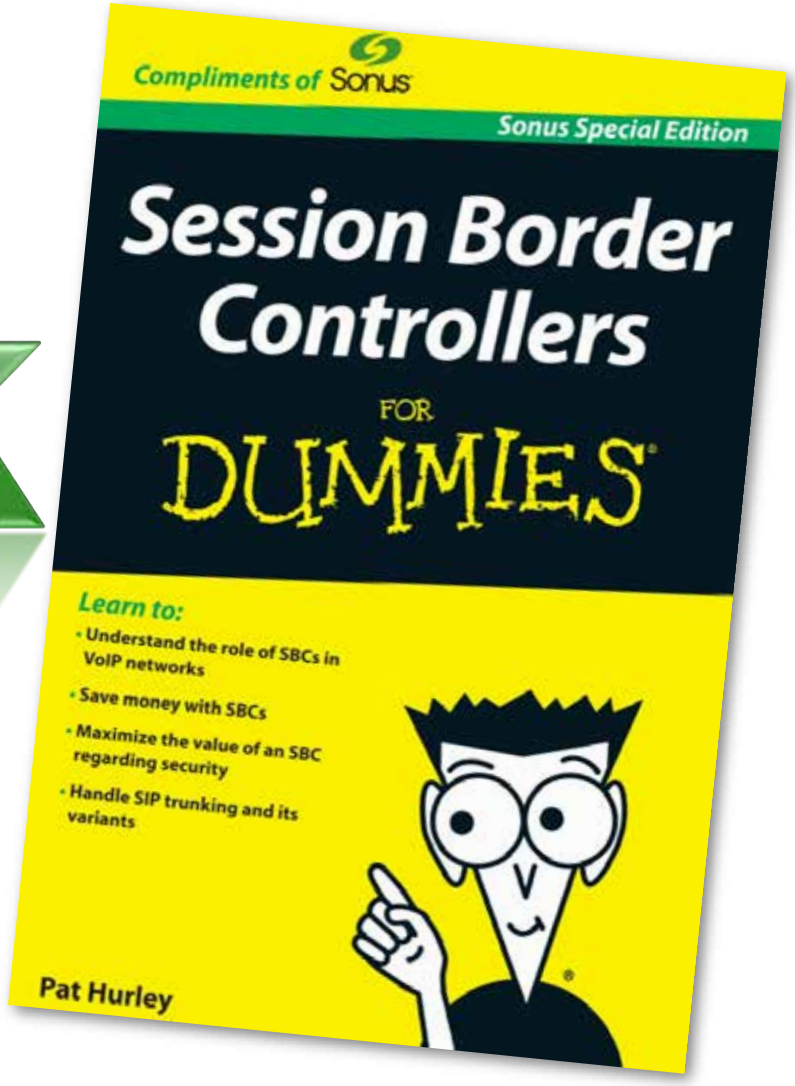
Sonus Harmony Architecture



Sonus Vision

Sonus Enables Cloud-Based Unified Communications So Businesses Are Smarter, Faster and More Productive

THANK YOU!



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SIP Best Practices

Andrew Prokop, SIP Architect

ARROW S3

Ask Yourself

- What Are You Looking to Bring Into Your Network?
  - SIP Trunks
  - Remote SIP Users
  - More Than Voice

Ask Yourself

- What Configuration Are You Trying to Build?
  - Resiliency
  - SBC Placement
  - Multiple Ingress and Egress Points
    - SIP Carriers / Communications Systems
  - Security Policies
  - Session Management and Cloud
  - Survivability
  - Scalability
  - Usage Separation

Ask Yourself

- Do You Have Special Needs?
  - FAX
  - Encryption
  - Transcoding
  - Adaptation
  - IPv6
  - Emergency Services (E911)
  - Contact Center and IVR

Ask Yourself

- What Are Your Reporting Needs?
  - CDR
  - Trunk Utilization
  - QoS Metrics
  - Billing
  - Attempted Security Breaches

Ask Yourself

- Don’t Forget About Troubleshooting!
  - Debug Tools
  - SNMP Traps

Choosing a SIP Trunk Provider

- Consider Reach
  - Regional? Nationwide? International?
- Flexibility
  - Service Bundling
  - Codec Choices
  - QoS
  - Encryption and Decryption
  - SIP Refer
  - FAX
  - Line Provisioning
  - Traditional TDM Features

Choosing a SIP Trunk Provider

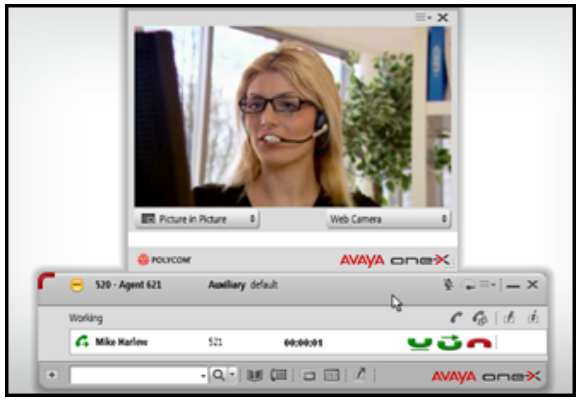
- Bursting
  - Availability? Provisioning? Billing?
- Survivability Options
  - Failover
  - Multiple Ingress / Egress / PSTN Carriers
- Fees
  - Bandwidth, Cost per Session, Number Porting, etc.
- Reporting / Metrics
- Ease of Administration
- Interoperability / Support

The Consumerization of IT

SIPPING-19

- Call Hold
- Music on Hold
- Consultative Hold
- Find Me
- Transfer Instant Message
- Transfer Attended
- Transfer Unattended
- Call Park
- Call Pickup
- Automatic Redial
- Click to Dial
- Message Waiting Indicator
- Call Forward Unconditional
- Call Forward Busy
- Call Forward No Answer
- 3-Way Conf Party Added
- 3-Way Conf Party Joins
- Incoming Call Screening
- Outgoing Call Screening

The Remote Enterprise Client

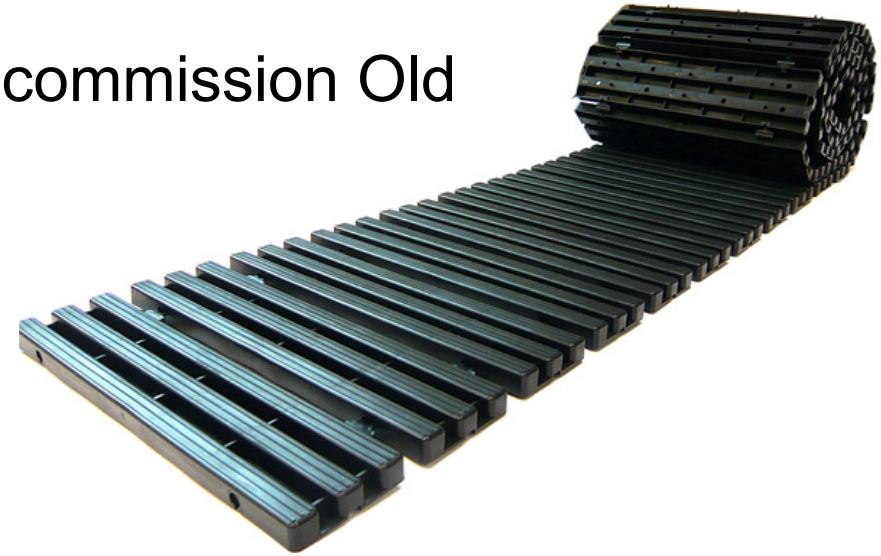


It Takes More Than SIP

- HTTP
- HTTPS
- SOAP
- SSL
- LDAP
- SCEP

Deploying SIP

- Gather Business Requirements
- Assess Readiness for Deployment
- Evaluate Carrier Offerings
- Design and Pilot Your Solution
- Rollout the Service
- Validate Deployment and Decommission Old Services



About Arrow S3

Arrow Electronics

Arrow Electronics is a global provider of products, services and solutions to industrial and commercial users of electronic components and enterprise computing solutions.

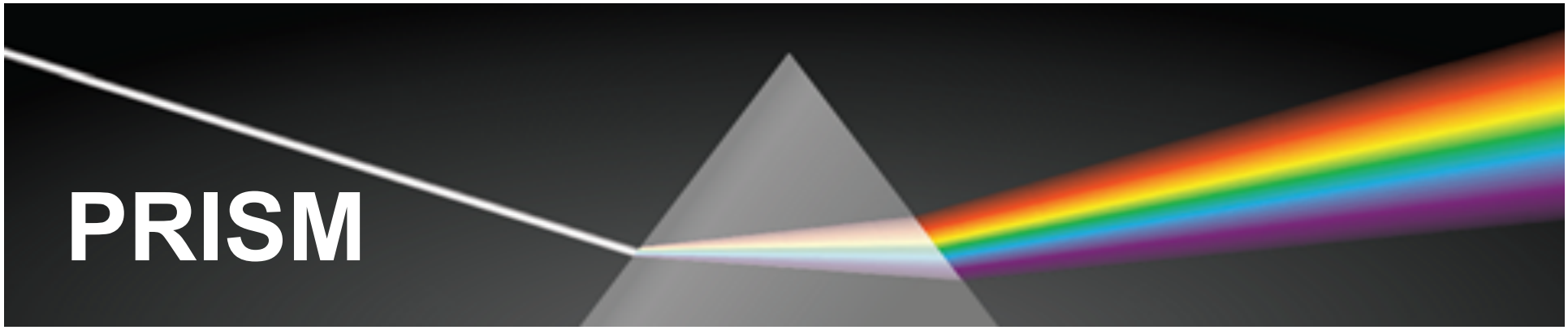
- Founded: 1935
- Ticker Symbol: **ARW (NYSE)**
- Website: www.arrow.com
- 2010 Sales: **$18.7B**
- Worldwide Locations: **340**
- FORTUNE 500 Rank: **#138**
- Headquarters: **Englewood, CO**
- Global Employees: **13,500**
- Customers: **115,000 globally**
- Suppliers: **1,200 globally**

PUTTING SIP TO WORK

Who is Arrow S3?

- We are a true TOTAL SOLUTIONS PROVIDER specializing in:
  - Unified Communications
  - Voice and Data technologies
  - Contact Center
  - Managed Service Delivery
- Founded in 1974, HQ in Irving, TX
- Employees: 1,400+ in North America
  - 90% customer-facing
- Over 170 certified sales professionals
- True National footprint of sales & service
- Industry-leading technical accreditations
- Active Customers Sites: 79,000
- Ports under Contract: 10m+

ARROW S3



An entire Spectrum of business transforming services that help customers make their transformation goals a reality

- **Assist Services**
- **Professional Services**
- **Managed Services**
- **Advisory Services**
- **Educational Services**

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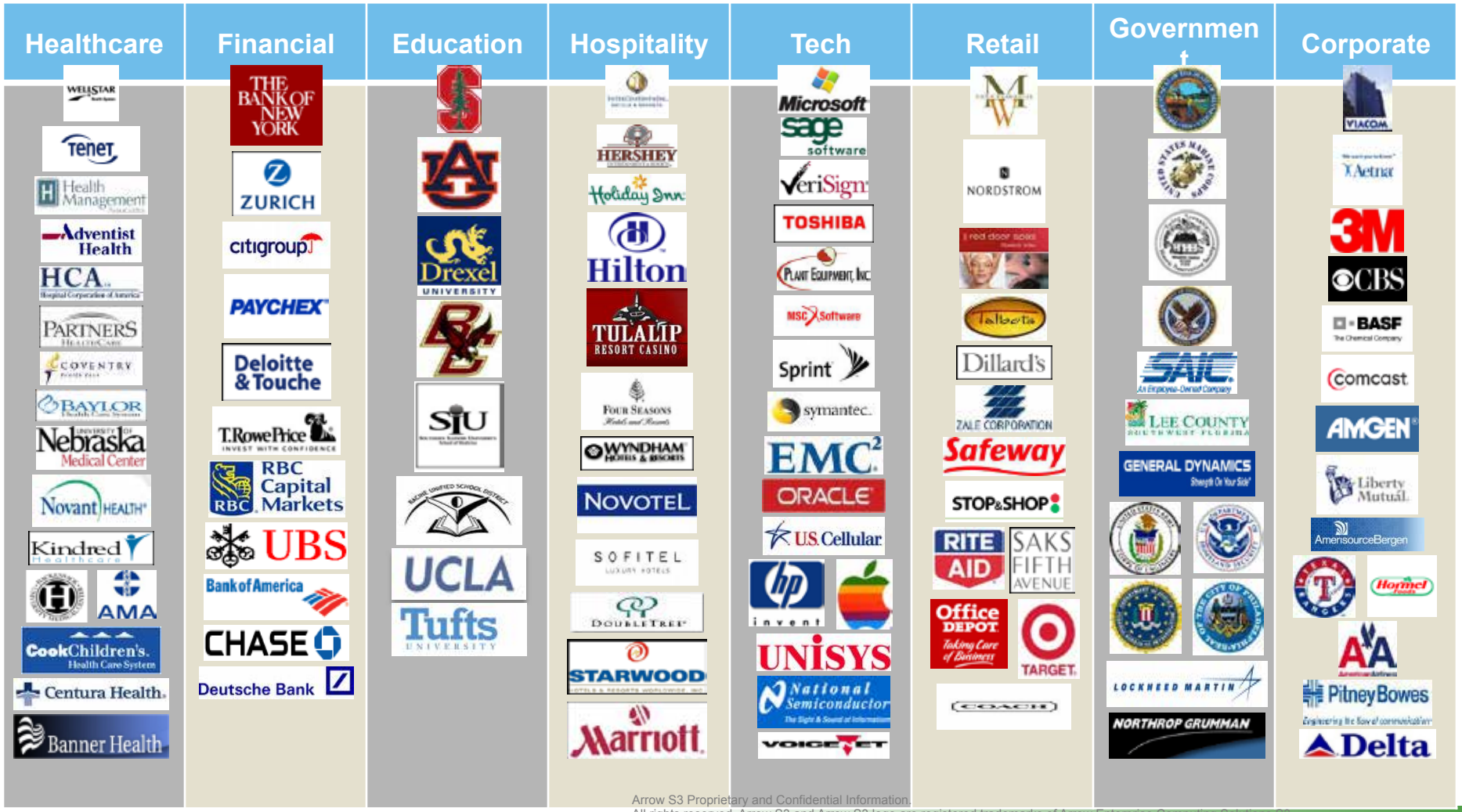
PUTTING SIP TO WORK

Key Verticals & Industries



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Thank you

Andrew Prokop
aprokop@arrow.com

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