

# Comparing Unified Communications and IP PBX Solutions and Costs: Premises-Based vs. Cloud-Based vs. UC Overlay

*Finding the Total Cost of Ownership, Financial Crossover Points, and Implementation Distinctions between the Three Options*

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# Comparing Unified Communications and IP PBX Solutions and Costs

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## Executive Summary

Many enterprises are in the process of creating their voice and unified communications (UC) strategy. Assuming that the business drivers have been identified for unifying their communications capabilities, enterprises must decide among three competing deployment options for their UC solutions<sup>i</sup>. These are

**Option 1 – Premises-Based (Private Cloud).** Install a new IP PBX (or equivalent software-based call control), including UC functions, on the enterprise premises or outsourced data center.

**Option 2 – Cloud-Based or Fully Hosted.** License and deploy PBX and UC functionality via a ‘Cloud’ or hosted option, that is any system servers and software will be hosted and run at the provider’s site with only user devices and necessary gateways and similar equipment on the enterprise premises.

**Option 3 – Overlay or Side-by-Side.** Install only the UC functionality so that it will co-exist Side-by-Side with the enterprise’s existing TDM-based or IP-based PBX(s) and telephones. Although overlay deployments can be implemented either on-premises or in the cloud, this report focuses only upon the on-premises option.

This document provides a financial comparison between these options and between multiple vendors for each option. It also provides commentary on the differences in functionality and in implementation approaches between the three options and the vendors’ solutions.

**Table 1. Vendors who responded to the RFP for Options 1, 2, and 3**

<i>Vendor</i>	<i>Option 1: On-Premises UC with New PBX</i>	<i>Option 2: Cloud-Based UC</i>	<i>Option 3: On-Premises UC PBX Overlay</i>
8x8		X	
Aastra	X		
Alcatel-Lucent	X		X
Avaya	X	X	X
Cisco Systems	X	(See Verizon)	X
Esna			X
IBM			X
Interactive Intelligence	X		
Mitel	X		
NEC	X	X	X
ShoreTel	X	X	
Siemens Enterprise Communications	X	X	X
Thinking Phone Networks		X	
Verizon		X	

Source information for this comparison is based on responses to a request for proposal (RFP) created as part of the Enterprise Connect Orlando 2013 program. Twenty-three different solutions from fourteen vendors are represented: nine for option 1, seven for option 2, and seven responses for option 3<sup>ii</sup>. There are clearly significant differences in responses for the three options and among the responding vendors. We have gone to great lengths to normalize the responses so that a consistent cost of ownership for each solution over a five-year period can be quantitatively compared.

## **Authors' Acknowledgement to Participating Vendors**

The authors express their sincere appreciation to the 14 vendors who invested time and energy into preparing the RFP responses which serve as the foundation for this report. Without their efforts, this report would have been impossible to prepare. We applaud their vision and their willingness to explore multiple options versus promoting and protecting one traditional approach. Universally, these vendors have expressed that this multi-option RFP exercise has been a valuable learning tool for them as well as it has helped them better position their offerings for this world of UC capabilities delivered as private cloud/on-premises solutions, cloud-based communication services, overlay deployments, and hybrid systems.

47 Figures, 21 Tables, 94 Pages

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## Introduction

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A broad and possibly confusing range of options face enterprises and organizations of all sizes as they consider immediate and future communications and collaboration needs. Traditionally, enterprise communications solutions have been installed as on-premises solutions often augmented with hosted audio bridging and Web conferencing services. However, recent economic trends as well as developments in the data center and in IP communications architectures are causing some organizations to seriously consider whether new approaches such as described in this report will produce better results, such as lower TCO, more effective services or both than are possible with traditional models for telephony, conferencing, and collaboration will meet their needs now and into the future.

IP telephony architectures have allowed centralizing telephony call control with the net result that the IP/PBX and the associated messaging platform often runs in a large, centralized data center (on premises or in a private cloud) which replaces many smaller PBXs located in branch offices. As a consequence of centralization, organizations may be able to save a sizeable amount on their IP telephony costs as maintenance charges decrease, the number of trunk lines is reduced or replaced by data network bandwidth services, power costs are less, and space requirements are reduced. The wide availability of SIP trunks and Ethernet backbone services also provides cost-saving opportunity when centralizing these architectures. It should be noted that certain use case classes may be better suited for distributed architectures. These classes may include heavy use of video in Unified Communications or enterprises that are heavily distributed (e.g. municipal government offices)

Communications vendors are also relying more and more on virtualized servers, which allows them to deploy their communications solutions on fewer physical servers which reduces rack space, power, and some operational costs.

New options are emerging which may make traditional hardware-based PBXs obsolete for certain classes of users. These software-based offerings often include other unified communications (UC) elements including presence/IM, conferencing and collaboration, and application programming interfaces (APIs) to embed communications within existing work process flows. When these new options include real-time communication to the PSTN, the new options may also make hardware IP-PBX services obsolete for additional groups of users within an enterprise.

The move to cloud-based deployment of communications applications and services is also impacting the communications space with UC-based cloud services offered by major vendors. Furthermore, a number of smaller cloud-based communications providers are emerging that have full unified communications capabilities based on their own software solutions. We also see the rise of numerous managed services providers that are causing organizations to reconsider how they will deploy and manage their communications solutions in the future.

What is clear is that there have never been more communications options available to organizations. These options can be broadly classified into three categories as follows:

**Premises-Based/Private Cloud.** This often consists of the enterprise's IT/telecom team installing a new IP PBX (or equivalent software-based call control), including UC functions, on the enterprise premises or at a networked co-location data center. In many cases, there will be a transition from an older communications system to the new one with ultimate decommissioning and removal of older communications equipment. Many of these solutions

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also provide audio, video and web conferencing and collaboration capabilities; some also provide tools for enhanced collaboration such as shared workspaces, social networking features, or document management.

**Cloud-Based or Hosted.** This solution category is provided by a service provider that offers communications as a service (CaaS). In the CaaS model, any system servers and software will be hosted and run at the provider’s site with telephony endpoints and survivability equipment on the enterprise premises. Essentially any of the solutions available in the Premise-based (Option 1) or Overlay (Option 3) cases are now available as a cloud-based or hosted services.

**Overlay or Side-by-Side.** The overlay option consists of installing new UC functionality so that it will co-exist side-by-side with the enterprise’s existing PBX(s). In this option, the reliance on the existing telephony may be reduced or ultimately phased out. Although overlay deployments can be implemented either on-premises or in the cloud, this report focuses only upon the on-premises option.

Each of the three deployment options discussed in this document – on-premises, cloud-based, and side-by-side – have a number of driving and inhibiting forces. In an effort to better understand these options, and to compare them in an apples-to-apples fashion, the report authors have created a unified communications RFP with as many common characteristics as possible.

Fourteen different vendors replied to the RFP as part of the Enterprise Connect 2013 program, with some responding to multiple deployment options. Based on these responses, we are able to provide calculations of the five-year total cost of ownership (TCO) associated with the three major solution types. Creating a TCO model has some uncertainties because of the complexity of a unified communications solution, and the assumptions we have used may be debated. Nevertheless, comparing premises-based to cloud-based to overly UC solutions is a timely and worthwhile exercise given the variety of options available and emerging in the market. We have attempted to make this report of value both to end users evaluating technologies and to vendors and service providers offering communications and collaboration solutions.

**Table 2. Vendors who responded to the RFP for Options 1, 2, and 3**

<i>Vendor</i>	<i>Option 1: On-Premises UC with New PBX</i>	<i>Option 2: Cloud-Based UC</i>	<i>Option 3: On-Premises UC PBX Overlay</i>
8x8		X	
Aastra	X		
Alcatel-Lucent	X		X
Avaya	X	X	X
BT		X	
Cisco Systems	X	(See Verizon)	X
Esna			X
IBM			X
Interactive Intelligence	X		
Mitel	X		
NEC	X		X
ShoreTel	X	X	
Siemens Enterprise Communications	X	X	X
Thinking Phone Networks		X	
Verizon		X	

## Comparing Unified Communications and IP PBX Solutions and Costs

In evaluating the solutions, we have tried to normalize them and make them as consistent as possible. If certain capabilities were not included in a vendor's RFP response, we have attempted to add it in based on our understanding of the market and the associated costs thereof. Cost elements added in include:

1. Personnel costs including vendor management and day-to-day operations both for any new systems and for old/existing systems until they are decommissioned.
2. Power and rack space costs.
3. Conferencing and collaboration costs.
4. Estimated local/long distance domestic US/Canada toll costs.
5. Wide area networking costs.

We believe this report provides a comprehensive qualitative and quantitative look at communications options available in the market from premises-based offerings, cloud-based solutions, and overlay deployments. This report should provide a very helpful baseline for any enterprise or organization that is considering a major upgrade or replacement of their PBX system or is considering an investment in Unified Communications applications. The authors welcome feedback from end users and vendors/service providers concerning the results presented herein.

## Summarizing the Request for Proposal

---

As a basis for our solution comparison and for the request for proposal, a fictitious company called Enterprise Connect Company (EC) was created. Enterprise Connect Company has three locations which include a headquarters location (HQ), a large remote office and a small remote office. As with many 'real' customers, EC has enjoyed the use of a Time-Division-Multiplex (TDM)-based PBX for many years. Although this system has served EC well in the past, it is no longer reliable or capable of meeting current business requirements.

EC wishes to evaluate three (3) different options for its future telephony and unified communications (UC) needs, based on the major trends visible in the market and being adopted by other enterprises. These are:

**Option 1.** Install a new IP PBX, including UC functions, on the EC premises. In this case, please response to all of the functionality requirements of this RFP for the on-site installation.

**Option 2.** License and deploy PBX and UC functionality via a 'Cloud' or hosted option, that is any system servers and software will be hosted and run at the provider's site with only user devices and necessary gateways and similar equipment on the EC premises. In this case, please respond to all of the cloud-based system functionality requirements of this RFP, showing which software and equipment are provided in the Cloud and which are on-premises are.

**Option 3.** Install only the UC functionality so that it will co-exist Side-by-Side with the enterprise's existing TDM-based PBX(s). Although overlay deployments can be implemented either on-premises or in the cloud, this report focuses only upon the on-premises option.

EC's facilities include a headquarters office with 1,750 users, a regional office with 200 users, and a branch office with 50 users.

EC will be responsible for all upgrades of internal data networking equipment necessary to fully support the proposed solution. This includes implementing QoS, PoE, VLAN and security. EC also will be responsible for ensuring that its network switching configuration is capable of supporting the requirements for the proposed hosted UC solution. An internal data network upgrade is out of scope of this RFP.

EC has an MPLS-based wide area network in place, but will consider running its communications solution over a wide area network provided by the Respondent if Respondent offers WAN services. In such a solution, Respondent will provide all required communications links between EC locations and will provide all required edge networking gear.<sup>iii</sup>

Figure 1. Topology diagram for Options 1 and 3.

Option 1: On-Premise IP Tel and UC

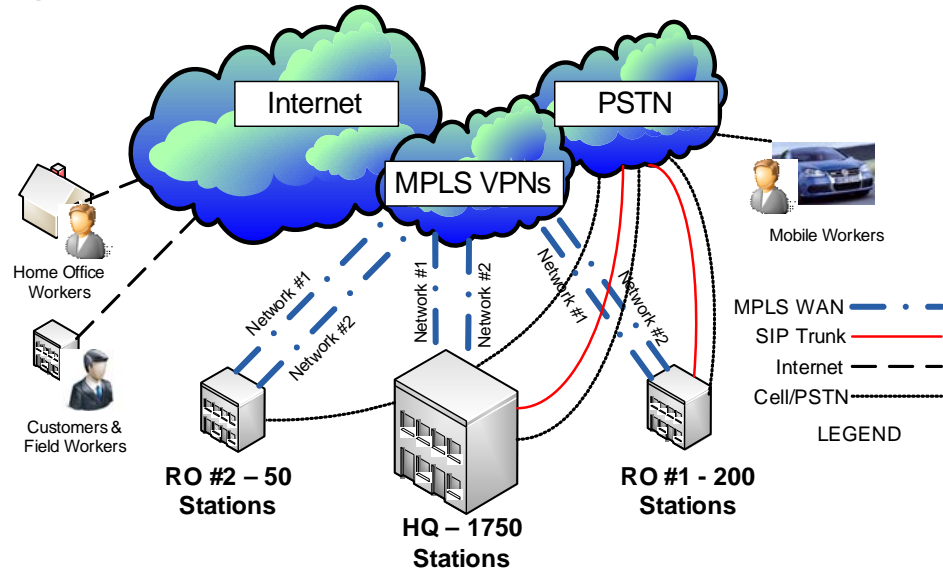
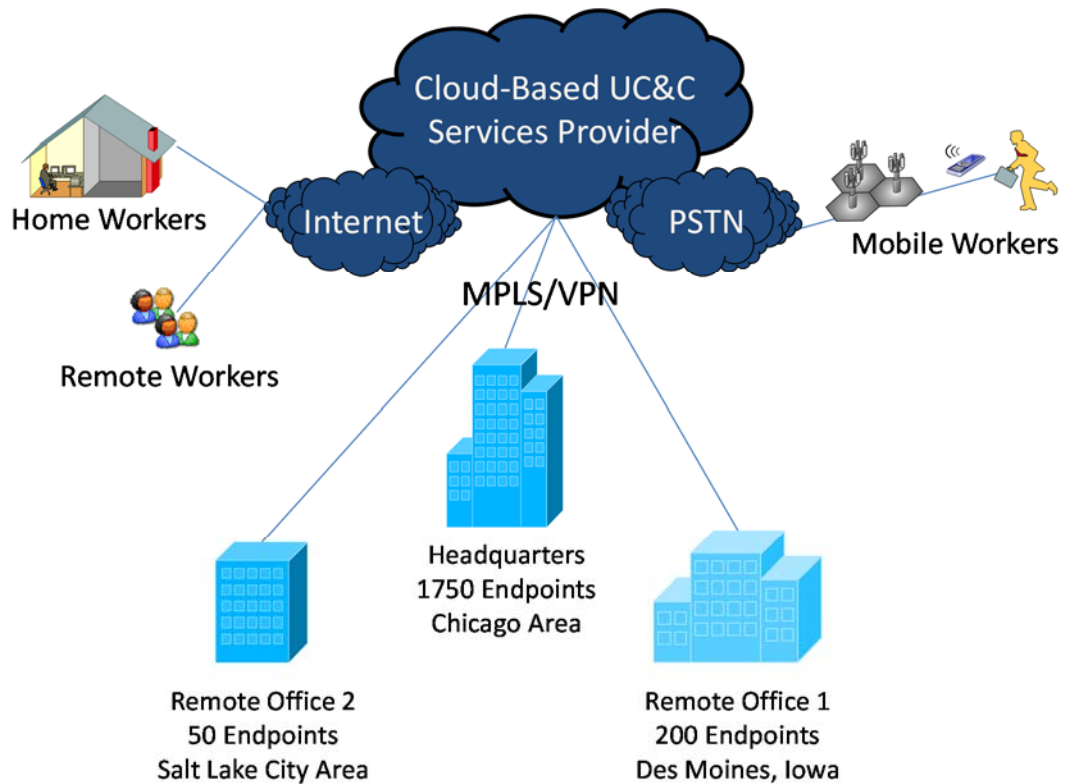
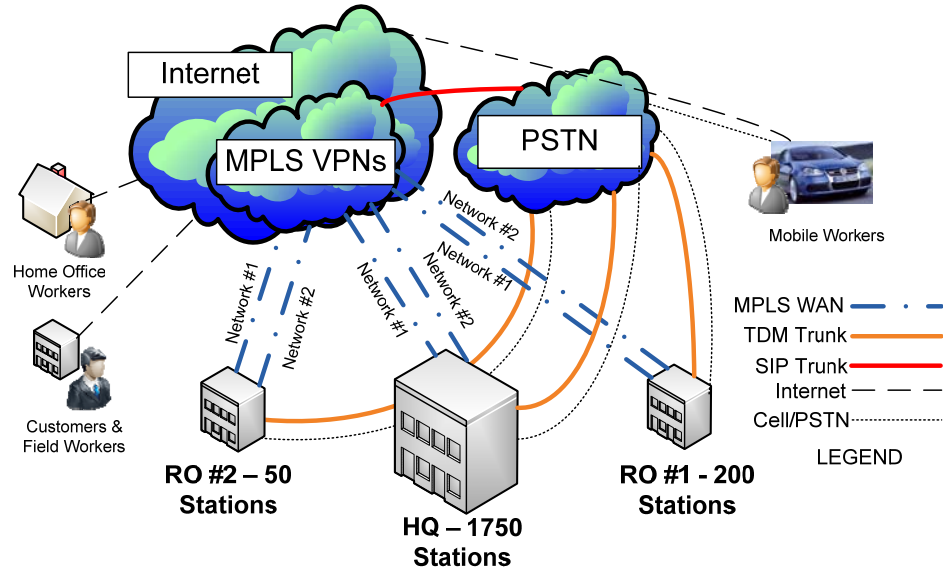


Figure 2. Topology diagram for Option 2.





**Figure 3. Topology diagram for Option 3.  
Option 3: On-Premise UC with Existing TDM PBX**



## An Overview of EC's Existing Communications Environment

HQ Site: Domestic USA 1,750 Users/station licenses, including 25 Analog Lines (faxes, relays)
Remote Office 1: Domestic USA 200 Users/station licenses, including 10 Analog Lines (faxes, relays)
Remote Office 2: Domestic USA 50 Users/station licenses, including 5 Analog Lines

EC currently has a mixture of PBXs depending upon location including Avaya, NEC, and Siemens.

In addition, EC has Cisco/Tandberg and Polycom H.323 video equipment at all of its offices; these units need to be able to interface with desktop and SIP video solutions proposed.

EC presently has its own internal email system based on Microsoft Exchange, it would like to assure that in the new solution end users can still use their Outlook client; hence, the unified messaging engine needs to support the Outlook client.

## Specifications for the New Communications Environment<sup>iv</sup>

Enterprise Connect Company has divided up its new communications requirements into seven sections as follows. Since Option 3 specifies that EC company will keep its existing telephony

## Comparing Unified Communications and IP PBX Solutions and Costs

environment, requirements for telephony, unified messaging, and contact center are not applicable to this option.

**Figure 3. Requirement summary for EC's new communications environment.**

<b>Requirements</b>	<b>Users per Requirement</b>	<b>Applicable Options</b>
Telephony	2,000 Users in Three Locations	1,2
Unified Messaging	2,000 Users	1,2
Contact Center	75 Agents	1,2
UC Client: Presence, IM, User Profile, Click-to-Communicate	2,000 Users	1,2,3
Conferencing: Busy Hour Traffic: 200 Simultaneous Voice Calls 133 Voice + App Sharing 67 Video + App Sharing	2,000 Users 500 Hosts	1,2,3
Mobile Communications Smartphone and Softphone Clients	600 Sales and Service 525 Management and Others	1,2,3
Communication-Enabled Business Apps	600 Staff, Logistics, Back Office	1,2,3
Communication-Enabled Workspaces (Integration with SharePoint or Quickr)	500 Research, Sales, Management	1,2,3
Installation and Maintenance	All users	1,2 3
Managed Services Requirements	All Users	2

1. System Architecture, Design, and Applications - Seven major requirements including 99.999% availability, survivability and redundancy, single sign on authentication.
2. Telephony Requirements – These requirements include items such as capacity, redundancy, network topology, trunk and bandwidth requirements, commercial availability (no beta solutions), handset and station requirements, required features, and emergency notifications. In all, there were ten major functional requirements with 118 specific required capabilities.
3. Contact Call Center Parameters – A 75 agent distributed call center was specified with 23 unique call center requirements.
4. Unified Communications Requirements – These requirements included specifications for presence and instant messaging, audio, video, and web conferencing, desktop clients, mobility solutions, and communications-enabled business process integration. In total, there were 174 unified communications requirements.
5. Unified Messaging – Most communications solutions include unified messaging; however, 46 unique features were specified.
6. Installation and Maintenance Services – These requirements included all services necessary to install the proposed solution and to maintain the proposed solution for five

## Comparing Unified Communications and IP PBX Solutions and Costs

- (5) years from date of acceptance. There were three major categories and eight specific requirements including 24x7 support, problem resolution times, etc.
7. Managed Services Requirements – This section included requirements for Lifecycle Management, Performance Monitoring, Reporting and Troubleshooting, Professional Services, Project Management and Training for the hosted UC solution for EC's 2,000 users. Fourteen major requirements were specified with over 90 specific requirements.

## About KelCor, Inc.

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KelCor ([www.kelcor.com](http://www.kelcor.com)) is a specialized consulting and analyst firm with a passion for providing client satisfaction through product and service excellence. We have laser focus on the business communications market, emphasizing those products and services that are proven to accelerate an organization's business processes.

We provide value to our end-user and vendor clients by offering an unbiased, 360° view of the unified communications and collaboration marketplace. We prepare research reports, vendor profiles, market forecasts, white papers, case studies, and presentations designed to inform, educate, and assist vendors with strategy, tactics, market approaches, and end user attitudes to help them identify and capitalize on opportunity. We help our end-user clients understand options, strategies, competitive vendor offerings, and best practices engaging our collaborative process engineering expertise, all designed to improve organization efficiency while increasing top line revenues or bottom line profits.

The depth of our reports and our ability to discern key market trends significantly differentiates us from any other analyst firm you've ever worked with.

## About Stein Technology Consulting Group

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Stein Technology ([www.steintechconsult.com](http://www.steintechconsult.com)) is a professional services firm providing IT Infrastructure consulting expertise for end user organizations. We are nationally recognized for providing analysis and Independent Consulting for lifecycle of IT infrastructure including voice, data, wireless, AV, security, data center and unified communications. This includes needs assessment, requirements definition, architecture, specifications/RFP, procurement, contract negotiation, implementation oversight, cutover management.

We often fill the role of Solutions Architect for mid-size organizations. We are also recognized for our abilities in business process evaluation and improvement; applying technology to solve the challenges faced by business units

## About UniComm Consulting

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Unicom Consulting LLC specializes in assisting enterprises with the identification of their opportunities to produce significant cost reductions and business improvements through Unified Communications (including Collaboration and Social Business). Our proven processes assist the enterprise IT planning and architecture teams in finding those areas in the enterprise where the dozen or so new communications technologies of UC can be applied to transform either the communications system topology and cost or the effectiveness of business processes, or both. We are vendor independent students of case studies so we can bring the successes of others to our clients' attention.

Don Van Doren brings two decades of Contact Center consulting experience to Unicom Consulting, which enables us to build on the lessons learned from those powerful, high ROI solutions. Marty Parker brings three decades of product line, financial and executive management in leading computing and communications companies to Unicom Consulting, which enables us to understand enterprise business models and the financial effects as well as the technological effects of our recommendations.

Website: [www.UniCommConsulting.com](http://www.UniCommConsulting.com)

Industry Forum: [www.UCStrategies.com](http://www.UCStrategies.com)

## About the Research Team

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### E. Brent Kelly

#### Enterprise Communications and Collaboration Strategic Advisor

Dr. Brent Kelly is a Vice President and Principal Analyst for Constellation Research, Inc., focusing on the intersecting technologies comprising unified communications, social business, cloud services and mobility. Dr. Kelly provides strategy and counsel to key Constellation client types: Chief Information Officers, Chief Technology Officers, investment analysts, VCs, technology policy executives, sell side firms and technology buyers.

Prior to joining Constellation, Dr. Kelly served for ten years as a partner at Wainhouse Research where he was the primary author of most of the firm's unified communications reports and forecasts.

#### Expertise

Dr. Kelly has experience as the Vice President of Marketing for Sorenson Vision, an early innovator in the IP communications space, and he has served as the chief executive in a privately held manufacturing company. Prior to this, Dr. Kelly was part of the team at Schlumberger that built the devices Intel used to test their Pentium microprocessors. He also led teams developing real-time data acquisition and control systems, and adaptive intelligent design systems in several Schlumberger Oil Field services companies including 4 1/2 years working in France.

He has worked as a research engineer for Conoco, implementing more efficient mathematical convergence methods for oil reservoir simulators, and as a process engineer for Monsanto.

#### Media Influence

Dr. Kelly is a regular presenter at Enterprise Connect (formerly VoiceCon), the communications industry trade show where his well respected half-day tutorials have covered topics such as hosted and managed unified communications services, Microsoft Office Communications Server technical deep dives, and IBM Lotus Sametime architectural reviews. He has also taught seminars in North America, Europe, Australia, and South America.

#### Education

Dr. Kelly has a Ph.D. in engineering from Texas A&M University specializing in thermodynamics and a B.S. in engineering from Brigham Young University. He serves as an elected official in his community.

Dr. Kelly can be reached at [bkelly@kelcor.com](mailto:bkelly@kelcor.com) or at [brent@constellationr.com](mailto:brent@constellationr.com). He is also available on LinkedIn and on Twitter @ebkell.

## David Stein

Mr. Stein, a principal with Stein Consulting Group, has more than 30 years of consulting, information systems and telecommunications experience, with a primary emphasis on IP communications and technology infrastructure projects. Mr. Stein has previously held key management positions with PlanNet Consulting, Inteliant Corporation and, COMSUL Ltd./Enterprise Consulting Group. Prior to starting his consulting career, Mr. Stein served as Director of Field Systems Engineering for ICL.

His expertise includes the entire technology lifecycle including needs assessment, process evaluation, operations impact, systems design, procurement and implementation project management for IP Telephony/Unified Communications, data center, cabling, facilities, LAN, WAN, network management, data security systems, telecommunications, technology relocation and construction projects. He is an excellent communicator and is skilled in dealing with management, facilities and technical personnel within IT and user communities. Mr. Stein has provided consulting services for assessing the effectiveness of IT organizations and developing governance models.

Mr. Stein's expertise includes technology planning and business case development for many significant technology infrastructure projects for both public and private sector clients. Previous engagements have included consulting for professional services firms (i.e. legal, financial), state and local governments, education (university and K-12), high tech, healthcare and entertainment. He is very effective in working with all levels of an organization.

Mr. Stein is a member of the Society of Telecommunications Consultants and the Project Management Institute. He holds a Bachelor of Science degree in Computer Science from Rensselaer Polytechnic Institute and has completed the 'Leadership and Management for Technology Professionals' program at University of California, Irvine.

Mr. Stein can be reached at [dave@steintechconsult.com](mailto:dave@steintechconsult.com).

## Marty Parker

Marty Parker is a Principal at UniComm Consulting LLC & Co-founder of UCStrategies.com

Marty focuses on helping enterprises improve their business results through Unified Communications. Marty sees UC as 'communications integrated to optimize business processes'. This includes collaboration tools and social media as well as implementation options via premise, cloud and hybrid deployments.

Marty's favorite business writers are Clayton Christensen, PhD, professor at the Harvard business school, whose book "The Innovator's Dilemma" and subsequent volumes shows us why and how disruption occurs, and Andy Grove, Chairman Emeritus of Intel Corporation, whose book "Only the Paranoid Survive" explains how to live happily and successfully in the disruptions of the technology markets.

Marty contributes to the industry via UC sessions at Enterprise Connect and Interop, industry webinars, posts on UCStrategies.com and NoJitter.com, and speaking engagements at customer, vendor and channel events. His background includes roles in sales, product management, financial management and general management with IBM, ATT/Lucent/Avaya, a major west-coast communications VAR, and at two venture-funded startups. Marty lives in Northern California and is a graduate of the Haas Business School, University of California, Berkeley.

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## Comparing Unified Communications and IP PBX Solutions and Costs

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<sup>i</sup> A fourth option is a hybrid solution that has elements the three other options. Given the difficulty in specifying such a system, the hybrid option is not considered here.

<sup>ii</sup> Some vendors responded to multiple options; thus, there are 23 different RFP responses but only 14 different vendors.

<sup>iii</sup> The cloud-based option required the provider to include the network costs as part of the RFP response. Consequently, we have used the average costs from these solutions to normalize the costs for the on-premises and the overlay solutions.

<sup>iv</sup> The original RFP may be obtained upon request by emailing one of the report authors.

<sup>v</sup> These personnel costs are for comparison purposes and will clearly vary based on the vendor and the solution implemented. We have assumed reasonable costs based upon our experience, but more complex deployments will likely require additional manpower. In addition, some vendors are easier to work with than others, and we have not factored in vendor process variations into these costs.

<sup>vi</sup> See [http://www.eia.gov/electricity/monthly/epm\\_table\\_grapher.cfm?t=epmt\\_5\\_6\\_a](http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_6_a). The aggregate US total is found at the bottom of this table.

<sup>vii</sup> See [http://www.usc.edu/its/pricing/computing\\_fees/colo\\_rackspace.html](http://www.usc.edu/its/pricing/computing_fees/colo_rackspace.html). This is what the USC IT department charges other university departments for rack space. Other internet locations show rack space at even higher costs. For example, see <http://prominic.net/web.nsf/pages/co-lo-rack> for \$1,299/month 36U racks and <http://www.creativedata.net/index.cfm?webid=225> for \$735/month 40U racks.

<sup>viii</sup> The number of minutes came from combining one of vendors' estimates of average long distance minutes for an organization this size along with some sanity check calculations from one of the authors. We have found that the analysis is somewhat sensitive to the number of long distance minutes as this can significantly impact costs for the on-premises and overlay solutions.

<sup>ix</sup> There are a variety of costs one could choose for SIP trunking. We have assumed 1.5¢ based on the based on some comments from members of the Society for Telecommunications Consultants. We have also consulted with one of the hosted services providers respecting this number, and it appears to be reasonable.

<sup>x</sup> This per minute cost is a reasonable cost as verified with a major global conferencing provider.

<sup>xi</sup> This per month cost is based on using WebEx. An interesting side note is that Cisco offered WebEx for five years at a cost of \$770,600 in its RFP responses. Using the figure above, the five year cost is \$870,000, but the first year of WebEx in the responses was included in the price of the Cisco user licenses.

<sup>xii</sup> One vendor asked to be removed after the report was prepared.

<sup>xiii</sup> Microsoft was invited to participate in all three RFPs and declined in each case. Nevertheless, we do have data for Microsoft from the 2012 RFPs wherein Microsoft responded to all three. Interested readers may contact the authors if they are interested in these Microsoft data.