

January, 2012

The Total Cost of Ownership Benchmarking Study for Unified Communications

Throughout 2011, Aberdeen analyzed the Total Cost of Ownership (TCO) associated with IP and legacy TDM (Time Division Multiplexing) telephony systems in 236 different corporate environments on a worldwide basis. TCO categories measured include capital costs, implementation and training, ongoing support, system administration, and network/long distance usage. This study provides specific insight for TCO in eight comparative metrics associated with the following telephony solutions: Cisco Unified Communications Manager (UCM), Cisco UCM Express, Microsoft Office Communications Server (OCS)/Lync, Avaya Aura Communication Manager, Avaya IP Office, ShoreTel and various legacy TDM systems.

The Importance of Total Cost of Ownership

Unified Communications (UC) represents the evolution of telephony, during which companies have augmented the traditional desk phone with other communications technologies including presence, instant messaging, conferencing modalities, mobility, and other capabilities based on business demands. As social, mobile, and cloud technologies have changed end user expectations regarding the quantity, ubiquity, and availability of communications systems, potential buyers have had to analyze the total cost of Unified Communications. In the past, buyers may have bought a landline phone solution based solely on the capital expenditure associated with the solution. However, this approach is becoming outdated for a couple reasons.

First, expectations for the lifespan of UC solutions are increasing. In research conducted for the December 2011 benchmark report [Business Optimization through Integrated Communications](#), Aberdeen found that the average respondent expected their next system to last at least six years, rather than the three-to-five year period typically associated with these solutions. To reflect these expectations, companies should consider the operational costs associated with their proposed solutions over the full expected lifespan of the UC solution.

In addition to the expectations of increased longevity for new communications systems, the increasing complexity of communications technology creates further support and management burdens for the enterprise. As a result, Unified Communications demands additional TCO considerations that do not exist in legacy telecom equipment.

Aberdeen provides guidance on comparing potential UC solutions by analyzing each deployment from a holistic TCO perspective.

Analyst Insight

Aberdeen's Insights provide the analyst perspective of the research as drawn from an aggregated view of the research surveys, interviews, and data analysis.

Solutions Analyzed in Greater Detail

Aberdeen tracked the solutions of 236 companies. To define a solution as trackable, Aberdeen required at least 15 respondents to use a solution. The following solutions were covered under this definition:

- √ Avaya Aura Communications Manager
- √ Avaya IP Office
- √ Cisco Unified Communications Manager (UCM)
- √ Cisco UCM Express
- √ Legacy TDM systems
- √ Microsoft Office Communications Server (OCS)/Lync
- √ ShoreTel

Defining Total Cost of Ownership

Unified Communications solutions are often judged solely in terms of capital expenditure. The PBX, phones, and other peripheral software and hardware costs can become the basis for a bidding war with aggressive discounting. However, this limited perspective avoids discussing the total business impact of a solution over its lifespan. Additional capital and operational costs of new Unified Communications solutions, such as network upgrade costs, system implementation, and ongoing system management, are often ignored.

In addition to upfront costs, a full reckoning of TCO includes the ongoing costs of UC throughout the lifespan of the system and technology ecosystem, including the business costs associated with legacy equipment and performance, maintenance contracts, software assurance, service orders, electricity, and related circuit and long distance charges. (Table 1)

Tracking TCO Cost Components

To track a TCO Cost Component, Aberdeen required a minimum of 30 respondents to provide a complete answer for their current cost burden in that category.

There were 12 cost categories tracked in this study, each of which is marked in light blue.

In addition, Aberdeen conducted vendor-specific analysis for cost components when a minimum of 10 responses were collected from two or more solutions.

Table 1: TCO Components for Unified Communications

TCO Category	TCO Cost Components	Tracked in Aberdeen TCO Study
Upfront Capital	IPT Telephony Equipment	Yes
	LAN Upgrade Equipment	Yes
	WAN Upgrade Equipment	Yes
Upfront Operational Costs	End User Training	No
	Inventory/Service Audit	No
	System Implementation	Yes
	Administrator Training	Yes
UC System Operating Costs (Annual)	System Maintenance	Yes
	Software Assurance	Yes
	Moves, Adds, Changes and Disconnects (MAC-D)	Yes
	System Management	Yes
	Internal Help Desk Resources	No
	Recurring End User Training	No
	Recurring Administrator Training	Yes
	Call Accounting	No
	Telecom Expense Management	No
	UC Security	No
	Cost of System Downtime	Yes
	Electricity Consumption	No
	Desk Phone Replacement	No
Smartphone/Mobile Device Replacement	No	

TCO Category	TCO Cost Components	Tracked in Aberdeen TCO Study
	Hardware Replacement	No
Ongoing Network Costs (Annual)	WAN Circuit Cost	No
	WAN Optimization	No
	End-to-End Voice Monitoring	No
	LAN Service Cost	No
	Voice Trunk Cost	No
	Long Distance Charges	Yes

Source: Aberdeen Group, January 2012

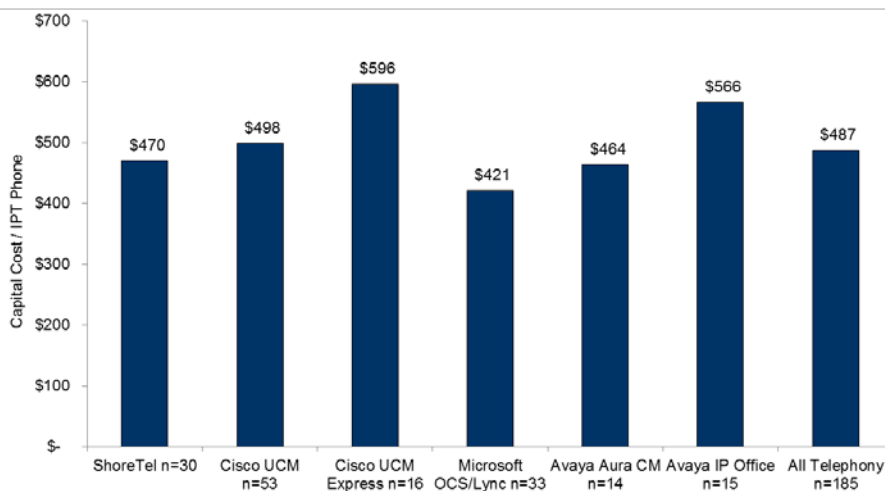
Upfront Costs

To understand the initial costs of a new UC purchase, companies must consider both capital and operational start-up costs. Since capital costs are tied to ongoing depreciation, they are often emphasized in pricing a UC system. This treatment de-emphasizes implementation, training, and network costs, which can significantly increase the upfront cost of a new deployment, and place strain on the expected project budget.

IP Telephony Capital Costs

When Aberdeen looked at the capital cost per IPT phone on a solution by solution basis, we initially found that cost did not match up well with standard list prices. Although some discrepancies were due to the inclusion of hardware and software costs, the pricing for Microsoft OCS / Lync, Avaya Aura, Cisco UCM, and ShoreTel were very similar. (Figure 1)

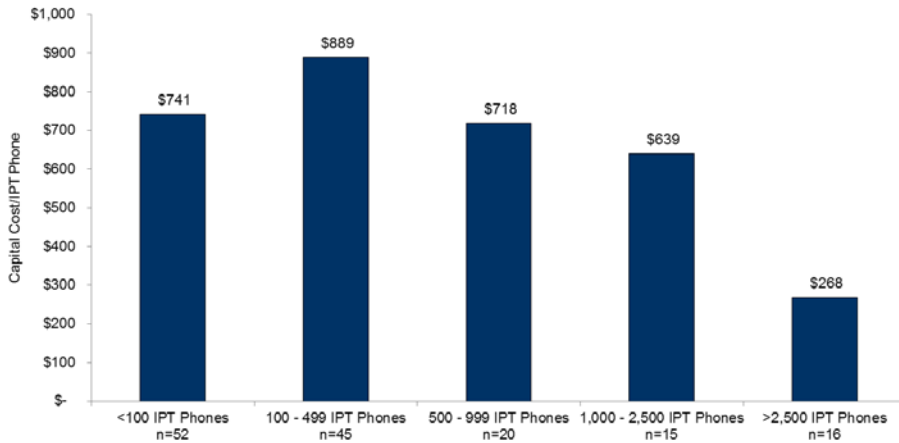
Figure 1: Capital Cost per IPT Phone - Vendor Comparison



Source: Aberdeen Group, January 2012

When Aberdeen looked at the cost of IPT phones from a phone count perspective, we found the per-phone pricing for large implementations to be much lower than for small and medium deployments (Figure 2).

Figure 2: Capital Costs per IPT Phones Based on Deployment Size



Source: Aberdeen Group, January 2012

The precipitous drop in IPT phone costs for large deployments demonstrates a fundamental difference in purchasing Unified Communications systems. On average, Aberdeen observed a 19% decrease in capital costs per phone both for companies in the 100 - 499 phone range and those in the 500 - 999 phone range. However, this difference paled in comparison to companies with over 2,500 phones, which averaged a 58% decrease in capital costs compared to companies in the 1,000 - 2,500 phone range. Even if a Fortune 500 organization is purchasing the same system as a smaller company, the difference in headcount will lead to significant discounts and bundled services that make a straightforward comparison between these two purchasing environments very challenging. In light of this finding, Aberdeen recommends that companies determine how many phones or endpoints are needed both for an initial and a final deployment, and plan ahead in procuring phones based on the intended final result. The difference may significantly reduce the deployment cost.

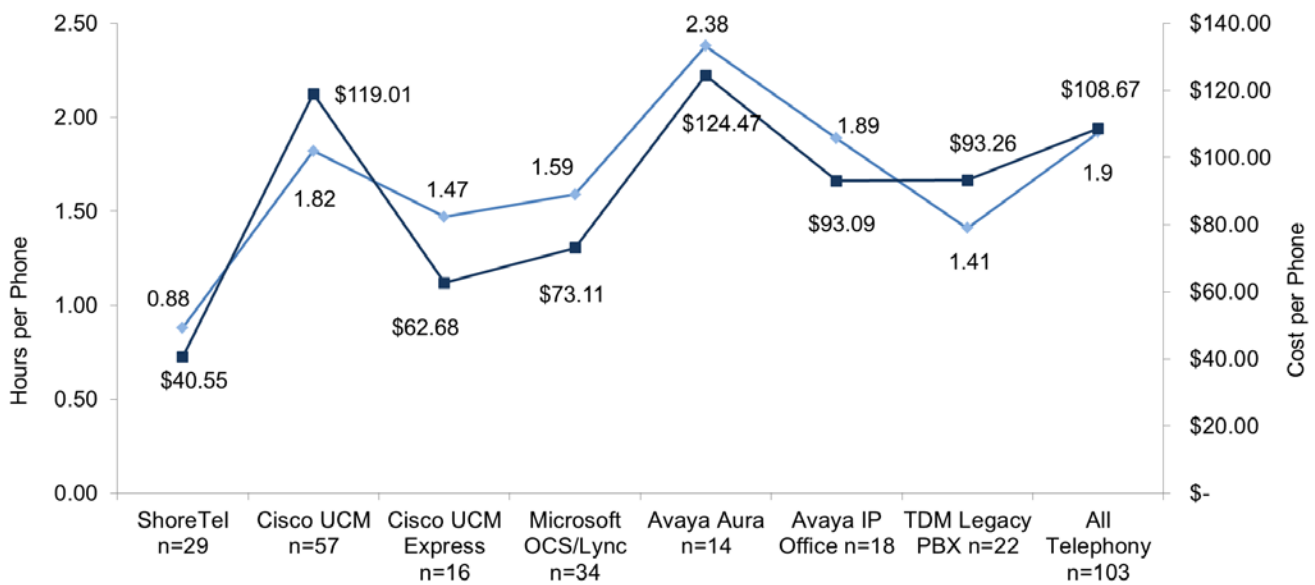
Network-Based Implementation Costs

Aberdeen found that 76% of IPT deployments had a LAN (Local Area Network) upgrade concurrent to their phone upgrade, and 53% conducted a WAN (Wide Area Network) upgrade. These activities increased bandwidth and supported high Quality of Service (QoS) levels, which were especially important given the importance of voice quality for UC. On average, companies spent \$165 per IPT phone to upgrade their LAN and \$33 per IPT phone to upgrade their WAN.

Operational Implementation Costs

In addition to capital expenditures and network upgrades, Aberdeen also observed considerable differences in implementation and training costs. These costs must also be considered as part of the TCO of a UC deployment. The vast majority of organizations (96%) used internal resources to deploy their phone system. However, 57% of all respondents took a hybrid approach, using both internal and external labor for implementation. The typical implementation based solely on internal labor and resources took 2.5 man-hours per IP phone, including planning, infrastructure changes, and setting up the actual phone. In comparison, hybrid approaches took an average of 1.6 man-hours per IP phone, showing that subject matter expertise can accelerate an initial deployment. To explore deployment labor in greater detail, Aberdeen tracked the time and cost per phone from different solution deployments (Figure 3).

Figure 3: Labor Time and Costs for IPT Deployments



Source: Aberdeen Group, January 2012

On average, IPT deployments took 1.9 hours per phone, and the average hourly internal cost per phone was \$108.67 (see Note on Compensation). Since the median IPT deployment in this study consisted of 245 phones, the typical labor cost per deployment was over \$26,000. Three points stand out in this analysis of the survey data:

- Avaya Aura deployments required 25% more time to deploy, on average, compared to the average IPT deployment.
- Cisco UCM deployment costs tended to require more expensive labor, which reflects the premium associated with Cisco certified

Note on Compensation

All hourly costs of labor were fully loaded, meaning that they represented the salary, benefits, and overhead associated with the employee.

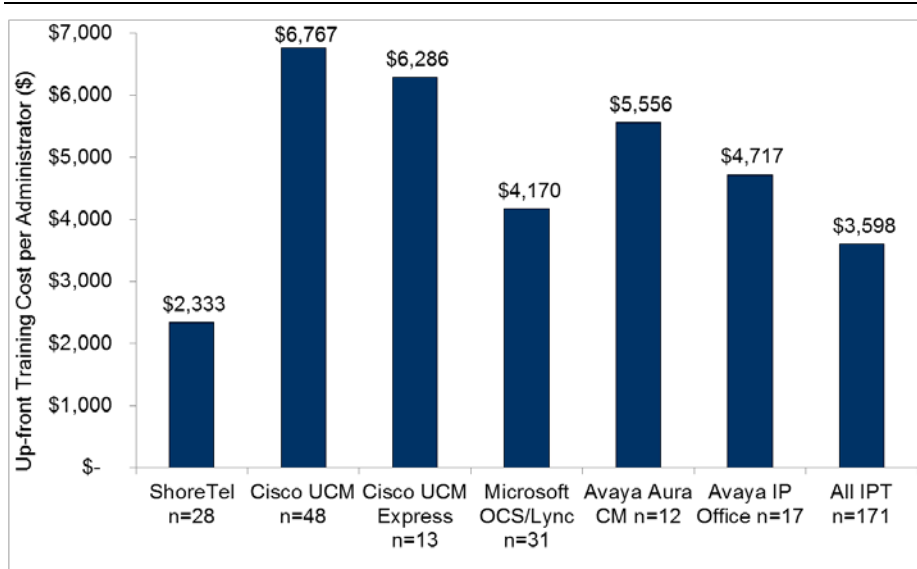
engineers and administrators. Compared to the average cost of internal labor, these employees enjoyed a 15% premium.

- ShoreTel deployments were, on average, completed twice as quickly as the average IPT deployment. For the median deployment, this represents a savings of over \$14,000.

Upfront Training

Internal resources often require up-front training on administering switches and software, troubleshooting new phones, or monitoring the systems and network associated with business traffic to support Unified Communications solutions on an ongoing basis. These issues result in training costs associated with a new IP telephony system (Figure 4).

Figure 4: Upfront Training Cost for New Deployments



Source: Aberdeen Group, January 2012

The cost of the first year of training ranged widely from solution to solution, although all solutions tended to require some level of upfront training associated with supporting a new solution.

- Cisco environments were associated with the highest average upfront training cost per administrator. These administrators often required new certifications to configure Unified Communications Manager to the organization's requirements.
- On the other end of the spectrum, Aberdeen's data indicates ShoreTel's initial training costs were 35% less expensive per administrator than a standard IPT deployment.

Recurring Costs

Once Unified Communications solutions are deployed, companies must support them. Recurring costs can include maintenance contracts, software assurance, the cost of service orders, the labor associated with ongoing system management, training costs, electricity, and the recurring circuit and long distance costs associated with a telephony solution. The operational expenses and support costs of UC become increasingly important, as they typically eclipse the original capital expenditures throughout the lifespan of the system.

System Maintenance and Software Assurance

Standard support costs for IP-based telephony systems include both system maintenance contracts and software assurance costs. Aberdeen found that annual maintenance and software assurance costs for respondents who provided this data averaged 17.6% of the capital cost of a system, which translated to \$117.18 per phone (Table 2).

Table 2: Enterprise Telephony Maintenance and Assurance Costs

	Annual Maintenance Costs per Phone	Annual Software Assurance per Phone	Combined Maintenance/ Assurance per Phone
ShoreTel (n=11)	\$40.20	\$29.75	\$69.95
Cisco UCM (n=57)	\$64.41	\$101.00	\$165.41
Microsoft OCS/Lync (n=35)	\$65.01	\$64.50	\$129.51
TDM Legacy PBX (n=27)	\$42.88	\$43.24	\$86.12
All IP Systems (n=101)	\$59.61	\$57.57	\$117.18

Source: Aberdeen Group, January 2012

Moves, Adds, Changes, and Disconnects

To support these deployments, companies must also take into account the time and labor associated with Moves, Adds, Changes, and Disconnect (MAC-D) service orders. The average environment in this study averaged 0.14 orders per phone and required 15 minutes per MAC-D service order. We compared the annual salaries and service order times for ShoreTel, Cisco UC, Microsoft OCS/Lync, and all environments. (Table 3)

MAC-D Orders

MAC-D is a telecom term referring to Moving service, Adding service, Changing services, or Disconnecting service. Any phone service change associated with an employee (new extension, new feature, etc.) requires a MAC-D order.

Table 3: The Cost of MAC-D Service Orders

	ShoreTel (n=24)	Cisco UCM (n=31)	Microsoft OCS/Lync (n=20)	All Telephony (n=118)
Minutes per MAC-D	6	17	18	15
Average Annual Salary: System Management	\$58,000	\$83,000	\$75,000	\$52,000

Source: Aberdeen Group, January 2012

Aberdeen found that ShoreTel respondents consistently completed MAC-D orders more quickly than those of respondents that used other solutions. These respondents were able to place basic MAC-D orders 2.5 times faster than the average respondent, on average. As a result, these companies were better equipped to support break-fix requests, and to support coordinated moves and disconnects during mergers and acquisitions, employee onboarding and off-boarding, and other important business activities.

Both Cisco UCM and Microsoft OCS/Lync deployments took slightly longer than average to place MAC-D orders, but these solutions stood out to a greater degree because of the cost of personnel who filled these orders. In traditional telephony environments, MAC-D orders were more likely to be placed by operational staff or non-specialized technicians. However, both Cisco and Microsoft deployments were more likely to require certified skill sets leading to higher compensation.

The ability to conduct MAC-D break-fix orders and migrations is important to the organization's perception of the quality of an IP Telephony phone system. Since many of these orders have to be done on an unscheduled basis when administrators find time, the ability to place orders quickly is helpful for administrators to support enterprise communications.

System Management

As Unified Communications has become prevalent, network concerns, endpoint support, troubleshooting, software support and technical support have all become more complicated. As an example, out of 220 organizations that discussed the applications they use with Aberdeen, most respondents stated that they had unified messaging, softphone, and audio conferencing capabilities built into their current communications environment. A quarter already had video conferencing as an in-system option. (Table 4)

Table 4: Built-in and Add-on UC Application Adoption

(N=220 for all applications)	Built-In	Add-on
Audio Conferencing	77%	16%
Video Conferencing	25%	57%
Instant Messaging	40%	42%
Presence	50%	28%
Unified Messaging	51%	33%
Softphone (Desktop Communications Interface)	61%	27%

Source: Aberdeen Group, January 2012

Communications system management requires a holistic view of voice, instant messaging, presence, voice mail, and other applications throughout the entire organization. To troubleshoot and support these environments effectively, companies must track all key functionalities--and do so in all locations, if they seek to provide communications services regardless of location. In light of this complexity, Aberdeen sought to understand the system management costs associated with IP telephony solutions (Table 5).

Table 5: System Management Salary Costs

	FTE's per 1000 phones	Average Salary per System Management FTE	Average System Management Salary Cost per 1,000 phones
ShoreTel (n=31)	1.81	\$58,000	\$105,000
Cisco UCM (n=52)	5.45	\$83,000	\$454,000
Cisco UCM Express (n=22)	2.25	\$72,000	\$163,000
Microsoft OCS/Lync (n=31)	2.85	\$75,000	\$214,000
Avaya Aura CM (n=14)	3.05	\$59,000	\$181,000
Avaya IP Office (n=15)	3.02	\$54,000	\$164,000
TDM Legacy PBX (n=44)	7.26	\$52,000	\$375,000

Source: Aberdeen Group, January 2012

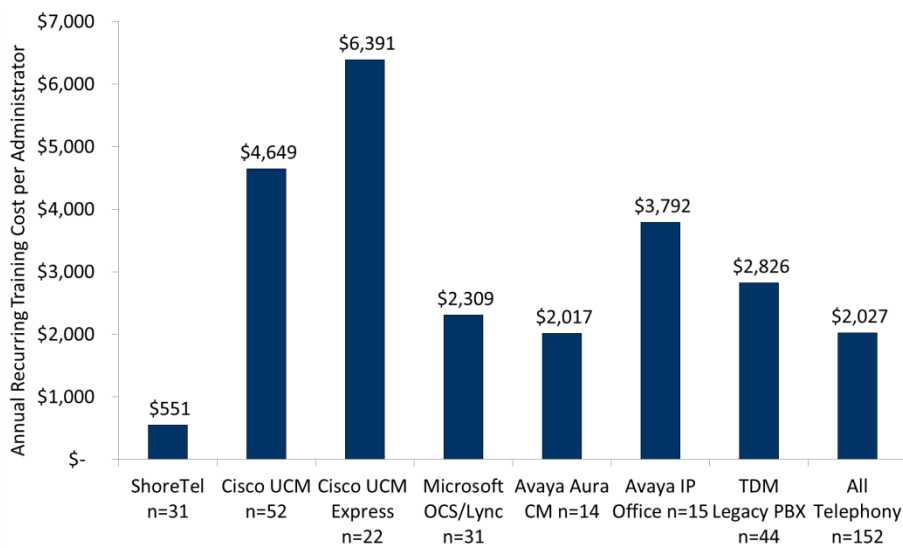
A hidden cost of TDM Legacy PBX solutions is the cost of support. Often, organizations with these systems are forced to have a full-time technician to support a couple hundred phones, leading to a very high support cost on a

normalized basis. In today's environment, the average cost per 1,000 phones among all respondents was \$137,000 based on an average of 2.6 FTEs committed to UC management.

Recurring Training Costs

As Unified Communications solutions are upgraded and the business demands new technologies, administrators require ongoing training to maintain and upgrade their skills. Aberdeen noticed that the average recurring training cost varied based on the type of solution used and the number of solutions supported (Figure 5).

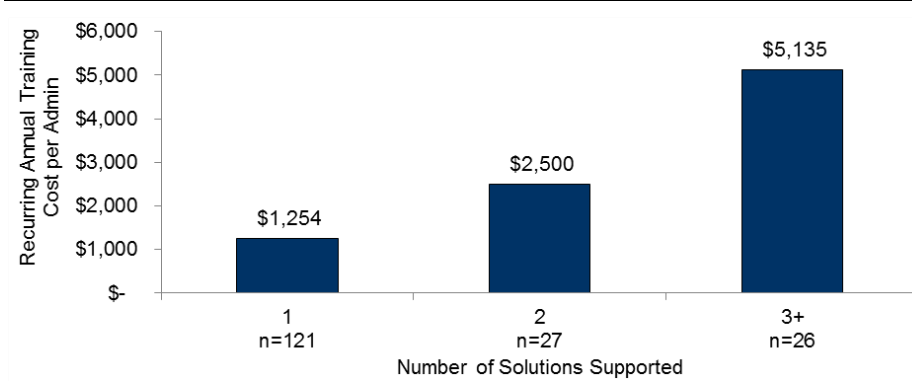
Figure 5: Recurring Training Cost per Administrator by Solution



Source: Aberdeen Group, January 2012

On average, Microsoft OCS / Lync and Avaya Aura administrators had training costs on par with all respondents, while ShoreTel administrators' training costs were significantly lower than average. TDM legacy environments were 39% above average for recurring training, even though many TDM environments are considered obsolete and no longer have any training associated with them. To understand this trend, Aberdeen studied the recurring training costs of each business in the context of the number of telephony solutions that were being supported (Figure 6).

Figure 6: Recurring Administrator Training Costs by Number of Solutions Supported



Source: Aberdeen Group, January 2012

Figure 6 shows how recurring training costs increase as companies work with multiple vendors. In multi-solution environments, the training cost nearly doubled when moving from one solution to two solutions, and doubled again for companies supporting three or more solutions. Training may be a hidden cost of a mixed solution deployment, if companies only consider the tax implications of capital expenditures when evaluating UC purchases.

Sixty-eight percent (68%) of respondents using ShoreTel had a single solution, compared to 70% of all respondents, indicating that the lower training costs seen by ShoreTel users are not due to a disproportionate number of them using a single solution. However, UC systems typically associated with large enterprises were unlikely to be single-solution deployments: only 28% of Cisco UCM and 35% of Avaya Aura deployments were deployed in single solution environments. In these cases, the recurring training cost of certification was compounded by additional training to support a multi-solution deployment.

The Cost of Power - Electricity and UC

Electricity should also be considered as part of the TCO for Unified Communications. Assuming a rate of 10 cents USD per kilowatt hour, every 1,000 watts costs \$72 per month. For a large UC deployment, which can represent 10,000 watts of power, this can scale into \$8,000 per year or more in electrical costs.

In addition to the raw electricity costs of the telephony system, organizations may also be concerned with carbon footprint or the ability to maintain uptime during power outages. Organizations seeking better control of UC-based electricity costs should consider solutions that selectively power down during non-peak times, or after close-of-business. In addition, companies should check how much power is required by each component of a proposed communications solution, including all servers and endpoints.

Network, Circuit, and Long Distance Costs

Although all organizations are familiar with being billed for network and telecom services by carriers and service providers, not all have considered how their Unified Communications providers can help optimize these costs.

When Aberdeen studied optimal strategies for cutting telecom costs in the March 2011 benchmark report [10 Ways to Improve Your Telecom Lifecycle Management](#), we found that 70% of Best-in-Class respondents (see right for definition) were able to visualize and categorize all their landline usage. Only a third of Laggard organizations had this capability. By understanding how Unified Communications is used, the organization can shape its communications solutions to optimize costs.

Companies that can identify how much traffic could be moved off the carrier network are better equipped to route long distance calls effectively and take advantage of this cost savings opportunity. Organizations that took advantage of their WAN virtually eliminated these charges. On average, 27% of long distance calls in Aberdeen's study were inter-office calls, but only 5% of traffic overall was over the WAN, showing that Aberdeen respondents are likely overpaying on over 80% of their inter-office traffic due to their inability to route these calls correctly.

Cost of System Downtime

When exploring the costs of service orders, system administration, and training, Aberdeen would be remiss if it overlooked the main goals of these activities: reducing unplanned downtime and supporting workforce productivity. On average, respondents said that unplanned downtime resulted in a 25% reduction in employee productivity and a 12% reduction in revenue. Despite the traditional telecom focus on "5 9's" (99.999%) uptime, which translates into about 5 minutes of downtime per year, few companies reached that level of excellence. On average, companies reported 118 minutes of unplanned downtime per year. Organizations can be crippled if they are unfortunate enough to experience this downtime during peak periods of customer or business activity.

Due to the network's effect on communications uptime, a PBX-only analysis of system downtime could not be completed. When Aberdeen followed up with the companies that had the greatest amount of downtime, we found that all of our respondents with over six hours of downtime blamed network problems for their unplanned outages. Organizations seeking to avoid unplanned downtime should have a strong business continuity plan for their UC environment, including contingency or high-availability plans to reroute calls if server failure or circuit impairment occurs for any reason.

Key Insights

This document has focused on the various elements of Total Cost of Ownership which should be evaluated when purchasing a new Unified Communications solution. Rather than simply consider the initial price tag and depreciation, closely analyze the operational costs your organization will

Best-in-Class Telecom Lifecycle Management (TLM)

The top 20% (Best-in-Class) achieved:

- ✓ 18% reduction in landline and network costs
- ✓ 20% reduction in wireless costs
- ✓ 86% of outage-based SLAs met
- ✓ 78% of Impaired Service SLAs met

The bottom 30% (Laggards) had:

- ✓ 3% reduction in landline and network costs
- ✓ 3% reduction in wireless costs
- ✓ 13% of outage-based SLAs met
- ✓ 13% of Impaired Service SLAs met

incur over the solution's intended lifespan. To capture the TCO of Unified Communications, Aberdeen provides the following recommendations:

- **TCO analysis must extend beyond initial capital costs, maintenance and software assurance.** These are typically the most visible costs associated with Unified Communications, but MAC-D service costs, training, certification, system management, network costs, long distance charges, and even electricity can play a role in determining the true TCO.
- **Understand the full cost of labor required to manage Unified Communications.** The labor that provides UC support adds to cost in several ways. Direct salary and employee compensation are straightforward costs, but the number of employees associated with UC support can vary widely depending on the complexity of deployment and the number of solutions supported. Employees can also require initial and ongoing training, which can add thousands of dollars per year per employee. There can also be an opportunity cost for onerous or burdensome tasks, such as MAC-D orders. Any time spent on mundane configuration and deployment is time taken away from preparing for key strategic technology efforts, such as cloud computing initiatives or mobility deployments.
- **Calculate all potential operational costs over the full intended lifespan of the solution for a complete TCO analysis.** Since the average expectation of a UC solution lifespan is now six years, accurate TCO analysis requires longer financial timeframes. Without this extension, it is difficult to understand the full cost structure associated with UC.

By tracking all capital and operational cost contributors associated with the total cost of ownership for Unified Communications, companies can make more informed decisions and purchase the most cost effective and functional solutions for their corporate needs.

For more information on this or other research topics, please visit www.aberdeen.com.

Related Research

<u><i>10 Ways to Improve Your Telecom Lifecycle Management</i></u> ; March, 2011 <u><i>Conquering the Fear, Uncertainty, and Doubt of Managing Integrated Communications</i></u> ; June 2011	<u><i>Mid-Market Demands for Telecom Lifecycle Management</i></u> ; August 2011 <u><i>Business Optimization through Integrated Communications: In the SoMoClo™ (Social, Mobile, Cloud) Era</i></u> ; December 2011
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Appendix A: Research Methodology

Between March and October of 2011, Aberdeen examined the use, the experiences, and the intentions of 236 enterprises using Unified Communications in a diverse set of geographies and industries.

Aberdeen supplemented this online survey effort with telephone interviews with select survey respondents, gathering additional information on cost structure, support structure, and operational efficiencies.

Responding enterprises included the following:

- *Job title:* The research sample included respondents with the following job titles: CEO / President (13%); CIO (11%); EVP / SVP / VP (9%); Director (21%); Manager (26%); Consultant (6%); Staff (10%); and other (4%).
- *Department / function:* The research sample included respondents from the following departments or functions: IT (51%), Business Development/Sales (15%), Corporate Management (11%), Product Development (5%), Operations (4%), and Other (14%).
- *Industry:* The research sample included respondents from a variety of industries including: IT consulting/services (22%); Telecommunications services (16%); Telecommunications equipment (13%); Software (9%); Government/public sector (9%); Education (7%); Computer equipment, hardware or peripherals (7%); Wholesale/distribution (4%); Financial Services (4%); Construction (4%); and Other (5%).
- *Geography Headquarters:* The majority of respondents (76%) were headquartered in North America. Remaining respondents were from Europe (14%), the Asia-Pacific region (7%), Latin America (2%) and the Middle East and Africa (2%).
- *Geographic Operations:* Respondents conducted operations in the following geographic locations: North America (80%); Europe (41%); Asia-Pacific region (37%); Latin America (24%), and the Middle East and Africa (23%)
- *Company size:* Seventeen percent (17%) of respondents were from large enterprises (annual revenues above US \$1 billion); 31% were from midsize enterprises (annual revenues between \$50 million and \$1 billion); and 52% of respondents were from small businesses (annual revenues of \$50 million or less).
- *Headcount:* Thirty-one percent (31%) of respondents were from large enterprises (headcount greater than 1,000 employees); 29% were from midsize enterprises (headcount between 101 and 1,000 employees); and 40% of respondents were from small businesses (headcount between 1 and 100 employees).

Study Focus

Responding executives completed an online survey that included questions designed to determine the following:

- √ The degree to which Unified Communications is deployed in their operations and the financial implications of the technology
- √ The structure and effectiveness of existing Unified Communications implementations
- √ Current use of Unified Communications to aid operational productivity
- √ The benefits and performance associated with Unified Communications

The study benchmarked multiple aspects of UC TCO while comparing the performance of end users who had deployed leading solutions. When Aberdeen had sufficient data, this study sought to provide direct comparisons between multiple solutions.

Appendix B: Solutions Studied In Detail

Note: Approximately 30% of our respondents were using more than one solution. These multi-solution environments were analyzed as separate vendor environments whenever possible.

Table 6: Solutions Studied in Aberdeen's UC TCO Study

Solution	Description of Solution
Cisco Unified Communications Manager (UCM) R7.1 or higher (n=68)	Cisco UCM provides IP-based unified communications capabilities for up to 40,000 users per cluster.
Cisco UCM Express R7.1 or higher (n=26)	Cisco UCM Express is designed to provide unified communications to branch offices and supports up to 450 employees per solution.
Microsoft OCS 2007 R2 or higher/ Microsoft Lync (n=42)	Microsoft Lync unifies voice, instant messaging, and conferencing.
Avaya Aura Communication Manager R5 and higher (n=19)	Avaya Aura Communication Manager is an IP telephony platform for mid-size and large organizations which includes conferencing and contact center capabilities.
Avaya IP Office R5 and higher (n=23)	Avaya IP Office provides voice for small and medium organizations and can potentially support up to 384 users on one system.
ShoreTel Release 9 or higher (n=40)	ShoreTel provides a UC platform with features including voice, routing, and unified messaging.
TDM Legacy Systems (n=72)	Represent traditional telephony solutions that do not access the internet and still use the dedicated telecom network.

Source: Aberdeen Group, January 2012

Appendix C: Vendor Summary of Key Data

Table 7: Key Metrics Analyzed on a Per-Vendor Basis

	ShoreTel	Cisco UCM	Cisco UCM Express	Microsoft OCS/ Lync	Avaya Aura CM	Avaya IP Office	TDM Legacy PBX	All Telephony
Customer equipment price / IPT phone (All Segments)	\$469.75	\$497.91	\$595.63	\$420.55	\$463.59	\$565.80	\$561.43	\$486.97
Internal implementation cost per desk phone	\$40.55	\$119.01	\$62.68	\$73.11	\$124.47	\$93.09	\$93.26	\$108.67
Up-front training cost per administrator	\$2,333	\$6,767	\$6,285	\$4,170	\$5,555	\$4,717	\$4,763	\$1,764
Annual maintenance cost per IPT phone	\$45.29	\$38.19	N/A	\$74.65	\$66.46	\$52.17	\$18.81	\$42.12
Annual software assurance cost per IPT phone	\$32.12	\$61.50	N/A	\$39.08	\$141.34	\$193.52	\$92.66	\$67.45
Average Minutes per MAC	6	17	N/A	18	N/A	12	16	15
FTEs per 1,000 IPT phones (All Segments)	1.8	5.5	2.3	2.9	3.1	3.0	7.3	4.1
Recurring Training Cost per Administrator	\$551	\$4,649	\$6,391	\$2,309	\$2,017	\$3,792	\$2,826	\$2,027

Source: Aberdeen Group, January 2012