Avaya IP Office
Total Cost of Ownership (TCO) vs.
ShoreTel Unified Communications Platform

Executive Summary

"Right-sizing" an IP telephony solution to the small or midsize office is important, as any excess hardware, software or system costs are multiplied across offices. This is especially the case for companies that need to deploy solutions to many branch offices. Furthermore, since IT support is not likely to be present at each office, it is important for vendors to provide an easy-to-use interface that allows non-technical office staff to make commonly required moves, adds and changes.

The Total Cost of Ownership (TCO) of a solution may be calculated in various ways, the simplest of which considers the cost of acquisition, installation, operation and maintenance of products/services. A typical product refresh/replacement cycle is 5 years, so the TCO of a solution includes the overall cost of owning the product over 5 years.

Avaya Inc. commissioned Tolly to evaluate the TCO and ease-of-deployment of their IP Office Release 8.1 in midsize office environments of 100, 400 and 700 users versus the ShoreTel Unified Communications Platform. Tolly found that Avaya IP Office delivers a TCO savings from 29% to 38% across the three deployment scenarios used. See Figure 1.

The Bottom Line

Avaya IP Office 8.1 delivers:

1 32% average TCO savings when compared to the ShoreTel Unified Communications Platform

2 30% lower upfront costs than ShoreTel in upfront costs for phones, licenses and hardware

3 Up to 33% lower maintenance costs than ShoreTel over 5 years

4 41% less energy consumption for phones than ShoreTel

5 Deployment flexibility with Avaya's hybrid architecture, which helps reduce TCO by reusing existing wiring and legacy endpoints

Total Cost of Ownership (TCO) Savings Over Five Years with Avaya IP Office vs. ShoreTel Unified Communications Platform
For 100, 400 and 700 User Deployments
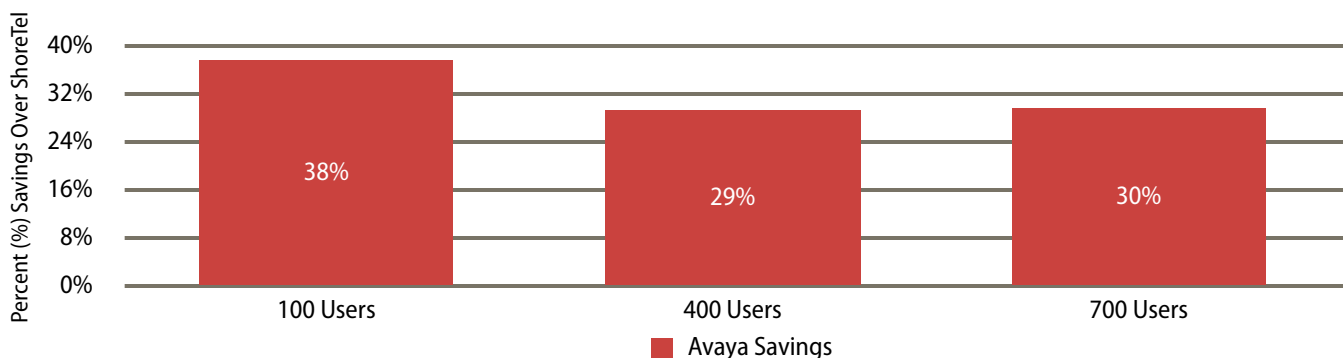
Note: Pricing current as of February 2013. Pricing sourced from third-party reseller of both Avaya and ShoreTel Solutions, with applicable vendor discounts. Annual maintenance calculated as 12% of total equipment cost. Pricing includes estimated power cost for 5 years.

Source: Tolly, March 2013

Figure 1

Introduction

IP Office TCO

Tolly found that the Avaya IP Office 8.1 offers significant cost savings over a five-year period-- up to 38% for 100 users. Additionally, Tolly found that even as the deployment grows, the Avaya savings are maintained - 29% for 400 users and 30% for 700 users. See Figure 1 and Table 2.

Tolly engineers found that Avaya IP Office 8.1 easily scales as businesses grow in both size and requirements by simply adding phones and applications. In addition, the Avaya solution supports a browser-based client implementation across Microsoft Windows, Linux/Unix and Apple Mac OS X operating systems, which allows for easy integration and deployment. See Table 1.

Test Results

Installation

While system installation is typically performed by the vendor's value-added reseller (VAR), it is useful to understand the steps and components involved as this can impact the cost and complexity of the systems.

Avaya Inc.

IP Office 8.1

Office Deployment & Total Cost of Ownership

Tested October 2012

Midsize Enterprise Unified Communications System Setup Process
Avaya IP Office vs. ShoreTel Unified Communications Platform

System Element	Avaya	ShoreTel
Voice Switch/Controller	Connect controller to Ethernet network and power up. System software comes pre-loaded on the server.	Connect the voice switch to Ethernet network. Find the Voice Switch in the ShoreWare Director management console and connect it to the ShoreWare Director Server.
Application Server	Integrated in the Server Edition package. For additional capacity, a second server can be added.	Power on ShoreWare Director Server. Connect via Remote Desktop Connection. Set time zone and static IP address. Activate server. Install ShoreWare Director application on server. Add ShoreTel licenses. Register ShoreWare Director and request the system key from ShoreTel.
System Configuration	Install the IP Office Admin Suite on a Windows PC.[1] Assign a static IP address for IP Office appliance. Install license keys. Update the firmware if needed. Configure user extensions.	Connect to ShoreGear voice switch. Upgrade firmware if needed, reboot switch. Configure ShoreWare Director by configuring site location information, IP address range for IP phones and configure users.
Client Configuration	To access UC capabilities, navigate the client machine to the Avaya one-X Portal	On client machine, set browser to ShoreWare Director to download and install Call Manager client.

Note: Both systems require a LAN switch for communication with IP phones as well as a DHCP server to provide IP addresses. The DHCP server does not have to be implemented on a Windows server. The vendors do not follow the same order for setup steps.
1. This does not need to be a server and is not a dedicated resource.

Source: Tolly, October 2012　　　　　　　　　　　　　　　　　　　　　　　　　　Table 1

The Avaya IP Office solution implements a UC module integrated into the IP Office appliance and thus can support a smaller office without requiring a dedicated UC server. In contrast, the ShoreTel solution requires ShoreTel Enterprise Edition for businesses with more than 50 users, which can contribute to a higher cost of ownership as resources must be allocated for its purchase and maintenance.

For a larger number of users, or businesses requiring a greater degree of sophistication, Avaya IP Office offers the choice of Preferred, Advanced or the new Server Edition. Each provides advanced functionality like higher

capacity voice messaging, UC, call reporting and recording.

Avaya IP Office Advanced Edition adds call center and analytics, while the Server edition adds Linux-based centralized management and licensing, as well as greater scale per site (up to 1,000 users).

Also of note, IP Office includes a 128-party secure meet-me audio conference bridge, supporting 64 users in any one conference.

The ShoreTel solution required engineers to set up a Microsoft Server 2008 R2 machine for which to provision the ShoreWare Director role (Note: The solution is also

available with a pre-loaded server for purchase). Like IP Office, the solution implemented some advanced features like voice mail-to-email notification service by default. The installation and configuration of ShoreWare Director was also relatively straightforward, and was completed in roughly 30 minutes, neglecting the provisioning of the Windows server. See Table 1.

The Avaya solution included the one-X portal client unified communication application to allow easy and secure access to the Avaya telephony, messaging, mobility and conferencing applications. The

Comparison of 5-Year Projected Capital and Ongoing Costs
Avaya vs. ShoreTel*

| Item | Projected 5-year Costs | | | | | |
| | 100 Users | | 400 Users | | 700 Users | |
	Avaya	ShoreTel	Avaya	ShoreTel	Avaya	ShoreTel
Capital Expense (CAPEX) Costs Equipment and Installation [1]	$ 50,598.07	$ 81,141.00	$ 201,213.50	$ 283,754.96	$ 336,008.57	$ 476,570.15
5-year OPEX Costs [2]	$ 6,986.23	$ 11,297.37	$ 27,803.50	$ 40,292.38	$ 46,722.32	$ 68,111.55
Optional Voice Conferencing	128 Lines Included	Up to 6 Lines Included	128 Lines Included	$ 16,300.00	128 Lines and 256 Ports Included	$ 16,300.00
Total CAPEX + 5 Year OPEX	$57,584.30	$92,438.37	$229,017.00	$340,347.34	$382,730.89	$560,981.70

Notes: * All prices shown were sourced from a VAR specializing in both Avaya and ShoreTel solutions. See detailed breakdown of CAPEX costs of both solutions in Tables 3 and 4.
1. Pricing for equipment and installation includes discount.
2. OPEX expenses include maintenance for 5 years (at 12%) and power consumption. Power Consumption costs were calculated using the formula "$0.10*(W/1000)*5*365*24" where $0.10 is the U.S. national average retail price of a unit of electricity for the commercial sector, as of March 2012. These prices were published by U.S. Energy Information Administration's Electric Power Monthly for November 2012, found online at http://www.eia.doe.gov/cneaf/electricity/epm/table5_6_b.html. The ShoreTel solution requires a dedicated server for all cases. For simplicity, both solutions were assigned equal power consumption for servers.

Source: Tolly, March 2013   Table 2

deployment was also very easy, delivered by providing just a URL link to the user to access the user-specific applications. This feature can yield significant time savings when scaling to hundreds of users.

Ease of Use

The Avaya IP Office 500 appliance is a self-contained call server and voice switch, which boasts some enterprise-class capabilities and a comprehensive default configuration.

In addition to a 10 minute deployment, the appliance hosts an integrated storage module, capable of capturing 380 hours of voicemail or call recordings, and can scale to nearly 400 users without any additional hardware. Furthermore, IP Office provides greater deployment flexibility, as nearly all Avaya/Nortel phones manufactured in the last decade are compatible. In addition, configurations and user profiles can be created offline and provisioned to the system in minutes, which simplifies multiple site deployments.

On the soft client side, the Avaya solution implemented the client access solution as a platform-independent browser-based (Java) application, so it can be used across all major desktop platforms. Additionally, both solutions provide native applications (Apps) for Android, iOS, and BlackBerry devices.

Capital and Ongoing Costs

When determining the total cost of ownership of a solution, there are several factors which must be taken into consideration. The upfront cost, or CAPEX, is one - typically including hardware, software, licenses and installation. The other is the operating cost, or OPEX, which includes ongoing maintenance and power consumption. See Table 2.

The upfront cost of the equipment for both solutions formed the most notable difference in capital expenses. In 700-user

Capital Costs for 100, 400 and 700 User Deployments for Avaya IP Office

	Item	Total Price
100-User Deployment	Hardware/ Infrastructure	$ 8,541.00
	Licenses	$ 23,333.50
	Phones	$ 22,860.00
	Discount on Equipment Applied by VAR*	$ 16,234.25
	Solution Sub-total	$ 38,500.25
	Installation	$ 12,097.82
	Total CAPEX	$ 50,598.07

	Item	Total Price
400-User Deployment	Hardware/ Infrastructure	$ 19,498.12
	Licenses	$ 74,413.00
	Phones	$123,732.00
	Discount on Equipment Applied by VAR*	$ 64,552.94
	Solution Sub-total	$153,090.18
	Installation	$ 48,123.32
	Total CAPEX	$201,213.50

	Item	Total Price
700-User Deployment	Hardware/ Infrastructure	$ 25,417.90
	Licenses	$125,610.50
	Phones	$212,508.00
	Discount on Equipment Applied by VAR*	$107,824.89
	Solution Sub-total	$255,711.51
	Installation	$ 80,297.06
	Total CAPEX	$336,008.57

Notes: For full pricing details please reference the Appendix to this document, Tolly Report #213120-APPENDIX.
1. The discounts applied to each solution are were sourced from a VAR specializing in both Avaya and ShoreTel solutions.
2. All prices shown were sourced from a VAR specializing in both Avaya and ShoreTel solutions.

Source: Tolly, March 2013   Table 3

deployments, Avaya hardware costs 62% less then ShoreTel. See Tables 3 and 4.

The Avaya solution is implemented as an appliance with optional pluggable line cards, while the ShoreTel solution is configured with a voice switch appliance and a dedicated application server. On average, across 100, 400 and 700 user deployments, the Avaya solution costs 32% less in capital expenditures, including hardware/ infrastructure, licenses, phones and maintenance than the comparable ShoreTel solution. See Tables 3 and 4.

However, ongoing costs such as power consumption, software upgrades and maintenance cannot be overlooked, as these play a significant role in the total cost of ownership of a solution. Tolly found that the Avaya IP Office solution will cost users approximately 31% less in operating expenses over 5 years. See Table 2.

Services/Maintenance

End users require a business partner contract typically costing between 6% to 18% of the solution cost depending on the service level desired. A typical service package costing 12% of the solution cost covers parts and labor, along with advance replacement for hardware and software updates, though these vary by reseller. Tolly calculated an estimated service contract cost at 12% of the CAPEX for each solution based on quotes received from a VAR that offers both Avaya and ShoreTel systems. On average, Avaya IP Office costs up to 33% less for maintenance than ShoreTel. For full details please reference the Appendix to this document, Tolly Report #213120-APPENDIX.

Power Consumption

The power draw of a system can be a major expense as deployments grow. Tolly engineers measured the IP phone power consumption of the Avaya phones versus ShoreTel. Tolly found that the Avaya phones

Capital Costs for 100, 400 and 700 User Solutions for ShoreTel Unified Communications Platform

	Item	Total Price
100- User Deployment	Hardware/ Infrastructure	$ 19,331.10
	Licenses	$ 28,039.00
	Phones	$ 25,830.00
	Discount on Equipment Applied by VAR*	$ 8,967.01
	Solution Sub-total	**$ 64,233.09**
	Installation	**$ 16,907.91**
	Total CAPEX	**$ 81,141.00**

	Item	Total Price
400-User Deployment	Hardware/ Infrastructure	$ 44,968.50
	Licenses	$107,626.50
	Phones	$103,320.00
	Discount on Equipment Applied by VAR*	$ 31,349.58
	Solution Sub-total	**$224,565.42**
	Installation	**$ 59,189.54**
	Total CAPEX	**$283,754.96**

	Item	Total Price
700-User Deployment	Hardware/ Infrastructure	$ 66,721.50
	Licenses	$184,680.00
	Phones	$178,290.00
	Discount on Equipment Applied by VAR*	$ 52,529.79
	Solution Sub-total	**$377,161.71**
	Installation	**$ 99,408.44**
	Total CAPEX	**$476,570.15**

Notes: For full pricing details please reference the Appendix to this document, Tolly Report #213120 APPENDIX.
1. The discounts applied to each solution are were sourced from a VAR specializing in both Avaya and ShoreTel solutions.
2. All prices shown were sourced from a VAR specializing in both Avaya and ShoreTel solutions.

Source: Tolly, March 2013   Table 4

Tolly.

IP Phone Power Consumption
Avaya vs. ShoreTel

Vendor	Model	Display Type	PoE Power Consumption[1] (W)		Effective Power Consumption[2] (W)	Power Consumption (W) in a Solution[3]		
			On-hook (idle)	Off-hook (in use)	90% on-hook, 10% off-hook	100 users	400 users	700 users
Avaya	9608	color	1.93	2.15	1.96	156.40	625.60	1094.80
	9611G	monochrome	2.50	2.67	2.51	25.17	100.67	176.17
	9621G	color	2.70	2.92	2.72	27.22	108.87	190.52
	Total Power Consumption (W) of Phones in the Solution					208.79	835.14	1461.49
ShoreTel	IP 230	monochrome	3.30	3.31	3.30	264.13	1056.53	1848.93
	IP 265	color	4.57	4.58	4.58	45.68	182.73	319.78
	IP 560G	color	4.60	5.05	5.05	46.45	185.80	325.15
	Total Power Consumption (W) of Phones in the Solution					356.26	1425.06	2493.86

Notes:
1. Read from PoE Switch management console. Reports PoE power draw reported at the switch port. Actual power consumption will vary for different PoE switches.
2. Effective usage of the phone in a typical office is assumed to be 90% on-hook (idle) and 10% off-hook (in use). Other usages like Call Centers may have higher off-hook usage ratio.
3. Each solution is assumed to consist of 20% economy-range phones, 60% mid-range phones and 20% executive-level phones.

Source: Tolly, October 2012   Table 5

exhibited up to 41% lower power consumption than the comparable ShoreTel phones. See Table 5 for detailed breakdown of the power consumption figures for the phones.

Administration

The Avaya solution delivered software upgrades using Secure Digital (SD) memory cards that can be plugged into the IP Office appliance, to initiate the upgrade process. Once the IP Office appliance has been upgraded, the upgrades get automatically downloaded to the IP phones at the next synchronization interval.

For the Preferred or Advanced Editions, the one-X Portal application and other software components installed on the server might need to be updated alongside the upgrade to the voice switch. The upgrade process involved downloading the update code over the Internet, backing up of any user profiles, voicemails and databases from the IP Office appliance and/or servers, and then applying

the updates either on an SD card plugged into the IP Office appliance or remotely over the Internet.

In contrast, the ShoreTel solution was more complex to upgrade, as both the ShoreGear appliance and the application server may need to updated. Updates from different versions might also require a conversion from one type of database to another.

Test Methodology

The test environment for both Avaya and ShoreTel solutions consisted of the components described in Table 6 and the IP Phones outlined in Table 5. Additionally, an Avaya ERS 4548GT-PWR switch was used to connect the solution components and provide power measurements for the IP phones for both vendors under test.

The initial setup of systems was conducted in October 2012 and the pricing was sourced closer to publication in March 2013.

Installation

Tolly engineers evaluated installation of both the standalone Avaya IP Office 500 appliance, as well as their server offering in the form of an HP DL360G8 server. In both cases, engineers followed the product documentation, and were able to deploy and upgrade the IP Office 500 within 10 minutes of initial power-on. The server appliance required more environment configuration. However, engineers were able to deploy and configure it in the mock environment within 20 minutes.

The ShoreTel Director software was deployed on a virtual machine running under VMWare Workstation 8. Prior to the ShoreTel Director configuration, engineers updated the Server 2008 R2 host to the latest patches and added the FTP, IIS, and Application Server roles. The time to configure the Microsoft environment was not included in the ShoreTel installation time.

System Components Under Test

Avaya IP Office 8.1 System Components		
Component Type	Component Name	Version and Notes
Telephony Control Unit	Server Edition	Firmware: 8.1.95.7
Client Unified Communication Application	Included in Server Edition	Avaya one-X® Portal Version 8.1.95.7 Voice Mail Pro Version 8.1.95.7
System Management Console	Avaya IP Office Manager	Version 10.1 installed on a single, non-dedicated Windows machine
Note: The 100-user scenario uses the IP500v2 chassis with Preferred Edition and the integrated UC Module. All software revs are the same as with server edition.		

ShoreTel System Components		
Component Type	Component Name	Version and Notes
Telephony Switch	ShoreGear SG220-T1 Voice Switch	ShoreWare Version 12.5.8107.0
Client Unified Communication Application	ShoreTel Operator Call Manager	Build 17.41.7005.0
System Management Console	ShoreTel Director Small Business Edition	Build 15.6.6206.0. Customer-installed on a Microsoft Server 2008 VM

Source: Tolly, October 2012   Table 6

Administration

In this phase of the evaluation, Tolly engineers performed typical system administrative tasks and noted the ease-of-deployment and functionality of the systems. Typical functions consisted of: importing users, adding trunk lines, configuring backups, and global system variables for use in the environment.

Engineers also evaluated the ease-of-upgrades and different administration options available.

TCO Evaluation

For the TCO aspect of the report, engineers crafted solutions for both Avaya and ShoreTel based on a common set of criteria. These criteria were deemed to be a representative set of required functionality for SMBs. The common configuration consisted of only SIP Trunks, only IP phones. Each of the solutions required full system redundancy for all users (Including Voicemail), mobility for 50% of the users, Voicemail and conferencing for all users. See Table 7 for details.

Simulated Deployment Configuration Requirements

TCO Deployment Parameters			
Total Users	100 Users	400 Users	700 Users
Power Users	25	100	175
Office Workers	25	100	175
Receptionists	1	1	3
# of Sites	1	1	2
Mobility	50	200	350
Redundant Voicemail	100	400	700
Site Resiliency		✔	✔

Source: Tolly, October 2012   Table 7

Quotes were sourced from a VAR which sells and maintains both of the solutions. Tolly engineers also compared obtained quotes to publicly-available pricing sourced online to ensure accurate estimations were made. As noted in the figures, a 12% yearly maintenance cost was added to each of the deployments.

The power measurements consisted only of the power needed to power each solution's

IP Phones, the power needed for the infrastructure (switches/servers) would be equivalent and therefore was omitted.

About Tolly

The Tolly Group companies have been delivering world-class IT services for more than 20 years. Tolly is a leading global provider of third-party validation services for vendors of IT products, components and services.

You can reach the company by e-mail at _sales@tolly.com_ or by telephone at +1 561.391.5610.

Visit Tolly on the Internet at: _http://www.tolly.com_

Competitive Interaction

Tolly Group reached out to ShoreTel to review the test plan and to participate in the evaluation. ShoreTel declined to participate in the evaluation.

For more information on the Tolly Fair Testing Charter, visit:
http://www.tolly.com/FTC.aspx

Terms of Usage

This document is provided, free-of-charge, to help you understand whether a given product, technology or service merits additional investigation for your particular needs. Any decision to purchase a product must be based on your own assessment of suitability based on your needs. The document should never be used as a substitute for advice from a qualified IT or business professional. This evaluation was focused on illustrating specific features and/or performance of the product(s) and was conducted under controlled, laboratory conditions. Certain tests may have been tailored to reflect performance under ideal conditions; performance may vary under real-world conditions. Users should run tests based on their own real-world scenarios to validate performance for their own networks.

Reasonable efforts were made to ensure the accuracy of the data contained herein but errors and/or oversights can occur. The test/audit documented herein may also rely on various test tools the accuracy of which is beyond our control. Furthermore, the document relies on certain representations by the sponsor that are beyond our control to verify. Among these is that the software/hardware tested is production or production track and is, or will be, available in equivalent or better form to commercial customers. Accordingly, this document is provided "as is," and Tolly Enterprises, LLC (Tolly) gives no warranty, representation or undertaking, whether express or implied, and accepts no legal responsibility, whether direct or indirect, for the accuracy, completeness, usefulness or suitability of any information contained herein. By reviewing this document, you agree that your use of any information contained herein is at your own risk, and you accept all risks and responsibility for losses, damages, costs and other consequences resulting directly or indirectly from any information or material available on it. Tolly is not responsible for, and you agree to hold Tolly and its related affiliates harmless from any loss, harm, injury or damage resulting from or arising out of your use of or reliance on any of the information provided herein.

Tolly makes no claim as to whether any product or company described herein is suitable for investment. You should obtain your own independent professional advice, whether legal, accounting or otherwise, before proceeding with any investment or project related to any information, products or companies described herein. When foreign translations exist, the English document is considered authoritative. To assure accuracy, only use documents downloaded directly from Tolly.com. No part of any document may be reproduced, in whole or in part, without the specific written permission of Tolly. All trademarks used in the document are owned by their respective owners. You agree not to use any trademark in or as the whole or part of your own trademarks in connection with any activities, products or services which are not ours, or in a manner which may be confusing, misleading or deceptive or in a manner that disparages us or our information, projects or developments.

213120--mts-2013-04-05-VerN