



Free Software Is Not Free: A Quantitative TCO Analysis

Executive Summary

A famous catch phrase coined during the Great Depression of the 1920s and 1930s was “There Ain’t No Such Thing as a Free Lunch.” The implication, of course, was that there is always a hidden cost to anything free—and free software is no exception.

A variety of software is available at little or no cost from a licensing perspective. Open Source software is a perfect example. Open source software is freely available for download, but there are tangential costs such as hardware required to run the software, labor to install and maintain it, and other software costs related to running the open source solution. The critical concept is to evaluate the total cost of ownership (TCO). As one might suspect, open source oftentimes still comes out lower in cost than commercial equivalents in the market. The point, of course, is to evaluate the entire TCO equation.

Microsoft System Center Configuration Manager, or SCCM, is commercial systems management software that many in the industry believe is free to use due to its inclusion in a number of Microsoft license bundles and Enterprise Agreements. When the TCO of SCCM deployments are evaluated, however, it becomes painfully obvious that SCCM is far from free—even small SCCM deployments are very expensive. For example, a 5,000-endpoint SCCM deployment costs over a million dollars over three years, and a very large SCCM deployment of 200,000 endpoints costs \$43M over three years—over \$14M a year!

BigFix provides equivalent functionality to SCCM for a fraction of the cost. The BigFix platform continuously discovers, assesses, remediates, and enforces the health and security of servers, desktops, and roaming laptops in real time via a single, policy-driven agent and single console, scaling to 250,000 endpoints with a single server.

BigFix patented technology distributes computing power to the devices themselves, using the intelligent BigFix Agent to provide a level of visibility and control that is not possible in legacy solutions. This level of innovation translates into significant advantages in speed, flexibility, and scalability, while reducing the infrastructure and training costs associated with traditional systems and security management.

BigFix saves substantial amounts of money compared to SCCM. For small 5,000-endpoint deployments, BigFix saves \$174K over three years, and BigFix savings for a 200,000-endpoint deployment are astounding: \$32.8M over three years and \$47.0M over five years—81% lower TCO than SCCM!

This white paper describes the methodology for analyzing the TCO for software solutions and concludes with an in-depth analysis of SCCM TCO for a variety of use cases. For more information about BigFix, visit www.bigfix.com.

Introduction

The interest in “free” software is at an all-time high, driven by a combination of economic conditions and the overall drive to contain costs. A variety of “free” software options exist, including open source operating systems and applications, and commercial offerings that are included as a part of a large software bundle, via an enterprise agreement, or in a master license agreement.

As conventional wisdom suggests, free is likely too good to be true. The same is true for software. Even open source offerings, while technically free from a license perspective, require substantial investments to make them “enterprise ready” in terms of required hardware, supporting software, services and labor to install, deploy, support and maintain production-quality systems. Scores of vendors like Red Hat, IBM and Novell/SUSE have built multi-million and billion-dollar businesses customizing and supporting open source software to make it usable in an enterprise environment.

As one would expect, “free” commercial software has many of the same limitations. When organizations receive application licenses in license agreement bundles, they are perceived as having no additional costs. This is a clever tactic on the part of software vendors. Additional license, hardware and services revenues required in order to make the product work can easily eclipse lost revenue from the “free” licenses by orders of magnitude.

It is therefore critical to evaluate the total cost of ownership (TCO) of IT investments throughout the entire investment lifecycle; typically a three- to five-year period. Taking total capital and operational costs into account, license costs comprise only a very small component of the overall TCO.

Is There Such a Thing as Free Software?

Open source is a classic example of free software that is not free. As indicated above, many vendors have built substantial businesses around customizing and supporting open source software. Red Hat, for example, is a worldwide organization with 3,200 employees and FY 2010 revenue of \$748 million, growing 15% a year—all built on a foundation of supporting open source Linux. SUSE, the number two Linux vendor, sold to Novell in 2004 for \$210 million, and the company continues to report strong SUSE growth. All of this growth and profits are great for the companies and their investors, but one has to wonder just how “free” software generates this much revenue.

Of course, open source software is not free. Properly implemented and managed, the TCO of open source software can be considerably lower than comparable commercial solutions, particularly when compared against proprietary solutions that require substantial quantities of high-rate services for customization, deployment and management.

The Hidden Costs of Free Software

When comparing the TCO of “free” commercial and open source software, be sure to include all of the following expenditures in the calculation:

Hardware

All software must run on hardware, of course, and regardless of whether the hardware is located on-site or at a service provider, it nonetheless represents a hard cost for any production system. Key costs to consider include:

- **Servers:** how many servers are required to operate the system at scale? Many systems require local servers at each remote location in order to provide adequate performance.
- **Storage:** what type of storage does the system require? Does it require expensive RAID drives or SAN technologies?
- **Network hardware:** what are the bandwidth and latency requirements for the system? Does it need high-end connectivity like Fiber Channel or converged Ethernet? How well does it function over highly latent, bandwidth-challenged networks like satellite links?
- **Backup, disaster recovery and business continuity:** how much hardware is required for redundancy, backup and DR/BC purposes?

Software

In addition to the core software licenses required for a particular software service, there are costs associated with “enabling” software required to make everything work together, including:

- **Server operating system license and support:** what type of operating system does the system require, and what are the costs? Be sure to include ongoing maintenance, training and support costs.
- **Database licenses:** if a relational database is required, what are the license and support costs?
- **Anti-malware, management, backup and other software required to ensure enterprise-class performance and reliability:** servers also require additional components to ensure that they are managed properly, which can add a significant percentage to the overall costs.

System Design and Implementation

The cost of designing and deploying enterprise-class software solutions often eclipses hardware and software costs many times over. Items to consider include:

- **Design and customization services and internal labor:** many systems today require a substantial amount of design, planning and customization services and labor before deployment. The market rate for vendor-provided services is \$300 an hour, discounted to an average of \$255 an hour in quantity. Also, consider the “fully burdened” cost of internal IT labor, including salary and benefits, which averages \$75 an hour in the U.S. (and can be substantially higher in some areas).
- **Hardware and software deployment costs:** once designed, all components of the solution must be installed, configured and tested. This includes the cost of vendor services plus internal labor to deploy the hardware and software across the organization. This is the point where the cost of certain vendor solutions that initially appear to be “free” can spiral out of control due to a lack of scalability that translates into large quantities of server installations. Do not forget to factor in the cost of installing software on user machines, plus travel costs as applicable.
- **Staff training and travel expenses:** the more complex the system, the more staff training (and retraining) is required. If training is delivered off-site, travel expenses must also be considered in addition to tuition costs.

Ongoing Maintenance Costs

Once a system is placed into production, costs to maintain server and user software and hardware, plus ongoing support, must be considered.

- **Physical space, power, heating, and cooling:** in addition to the cost of the physical hardware, space must be provided, plus power, heating and cooling. Studies have shown that for every dollar expended to power equipment, an additional dollar is expended on heating and cooling.
- **Software and hardware maintenance:** the larger the hardware deployment, the higher the overhead required to keep all of those machines running and up-to-date.
- **Ongoing service, support, updates and upgrades:** in addition to the basic server software and hardware maintenance, also consider the cost of updates and upgrades, both in terms of software maintenance costs plus labor required to patch and upgrade the systems. For systems that require software installation on both servers as well as user machines, this can represent a substantial cost every year.

Now that a sufficient foundation for comparing the relative TCO of “free” software solutions is established, a quantitative analysis of a commonly mistaken commercial software offering, Microsoft System Center Configuration Manager, or SCCM, is outlined in the next section.

Is Microsoft System Center Configuration Manager Free?

Many Microsoft customers believe that Microsoft System Center Configuration Manager is a free product because licenses for portions of it are included in Microsoft license bundles. This section provides a detailed analysis of SCCM total cost of ownership from a number of perspectives, including system architecture, hardware costs, management software licenses, other required software, deployment costs, and ongoing maintenance costs, proving that SCCM is far from free.

When architecting an SCCM deployment, locations are defined as either primary or secondary. Primary locations are major corporate hubs like a headquarters location, and secondary locations are smaller branch offices, restaurants, or stores that connect to a primary location via wide-area network (WAN) links.

Below is a detailed SCCM cost analysis created from a variety of sources, including Microsoft Services, industry analysts and publicly available data on the Internet. Software cost data was obtained from publicly available pricing from the Microsoft Volume Licensing Tool, based on retail Microsoft prices less a 25% discount, in June 2010. Hardware prices were obtained from HP's Web-based hardware pricing tool, also discounted by 25%.

The cost analyses below divide the SCCM TCO into several sections: SCCM Planning, Hardware Requirements, Additional Server Software Licenses, SCCM Management Software, and SCCM Deployment and Maintenance Costs.

SCCM Planning

The first stage in a production system deployment is to design the solution based on vendor best practices. Due to SCCM's complexity, Microsoft customers generally engage Microsoft professional services to analyze their needs and recommend a system blueprint that would serve as the basis for the deployment. These analyses generally range from one week to a month of billable time, costing between \$9,000 and \$36,000.

SCCM does not scale well, averaging one server for every 1,500 managed servers and workstations (also known as endpoints), and Microsoft generally recommends that a server be placed in every remote location connected to a primary location via a WAN link.

For example, Microsoft recommended the following architecture for a 65,000-endpoint global company that required management of their entire organization, distributed among four major geographical regions:

- 4 Primary SCCM Servers
- 32 Small Site Servers
- 8 Management Points
- 14 Distribution Points

Grand Total: 48 SCCM Servers

Because SCCM requires many remote site servers in order to scale, management server license costs skyrocket as the number of remote sites increase.

As one might expect, acquiring, configuring, installing and deploying 48 SCCM servers requires a substantial investment. The next section expands on this notion, quantifying SCCM costs for four different case studies.

Hardware Requirements

Once the system architecture is determined, it is possible to calculate approximate hardware costs from the recommended configurations for each server type defined in the Microsoft documentation. The hardware costs below were calculated using the HP hardware pricing website, less a 25% volume discount.

SCCM Hardware

As indicated above, SCCM requires a substantial hardware investment. Depending on the size of the deployment, Microsoft recommends central site servers, primary site servers, software update points, reference primary sites, management points, and fallback status points, all of which can require separate server hardware—plus backup servers for each. For example, Microsoft recommends the following hardware for a 65,000 endpoint project comprised of four “primary” locations, 16 “secondary” locations, 59,000 workstations and 6,000 servers, based on published best practices¹, as follows:

- Primary SCCM Server (4)
 - 4 core, 3 GHz Xeon CPU; 16 GB RAM
 - (4) RAID 1, (6) RAID 5, and (8) RAID 10 146 GB disks
- SCCM Remote Site Servers (16) and Warm Standby Servers (16)
 - 4 core, 3 GHz CPU; 16 GB RAM
 - (4) RAID 1, (6) RAID 5 and (8) RAID 10 146 GB disks
- SCCM Management Points (8) and Distribution Points (4)
 - Single core, 3 GHz CPU; 4 GB RAM
 - (2) 72 GB RAID 1 disks

Total SCCM Server Hardware Costs: \$524,000

¹ “Planning and Deploying the Server Infrastructure for Configuration Manager 2007”, Microsoft TechNet (<http://technet.microsoft.com/en-us/library/bb680397.aspx>)

Additional Server Software Licenses

In addition to the server hardware requirements specified above, it is also necessary to provision SCCM management servers with supporting software, such as operating system, database and utility software. The estimated server software costs for SCCM are detailed in this section. Note that Microsoft software pricing was obtained from the Microsoft Volume Licensing website in June 2010 and reflects a 25% discount on the list price.

Per Microsoft documentation, SCCM servers require Windows Server 2008 Standard. Since SCCM is available bundled with or without SQL Server licenses, database costs are included in the SCCM license costs above.

Another major SCCM software dependency to be aware of is that in order to provide “enterprise class” security, Microsoft requires that every machine that participates in the SCCM domain authenticate by providing a digital identity via a signing certificate. Certificates are generally managed and distributed via a Public Key Infrastructure (PKI), which is a very expensive component of the SCCM deployment costs. Studies have shown that deploying signing certificates via a PKI can cost \$8 per machine in large quantities².

Many SCCM servers also require additional software, including the IIS Web server, Active Directory, and Windows Server Update Services (WSUS). Note that these services are not included in the price estimates below, since they are generally either included with the server operating system or are licensed as a part of an enterprise agreement.

SCCM Windows Server License Costs: \$149,000

PKI Deployment Costs: \$520,000

SCCM Management Software

When evaluating products that deliver System Lifecycle Management, it is important to realize that there are typically three types of licenses involved: management server, managed servers, and managed endpoints. Management server licenses are for the actual servers that perform the management tasks, while managed server licenses are for servers managed by the management infrastructure. Managed endpoints include all other devices, such as desktops, laptops, workstations and mobile devices. When the TCO of any management software is evaluated, be sure to include an evaluation of the costs for all three license types.

² *Why outsourcing your PKI provides the best value: A Total Cost of Ownership analysis*, Entrust Corporation, July 2009

Many Microsoft customers believe that SCCM is free because SCCM licenses are bundled with other licenses in a variety of creative ways. There are three main types of SCCM licenses: SCCM client (or endpoint), SCCM management server, and SCCM managed servers. The differentiation between the last two licenses is that the former are licenses specifically for SCCM servers, and the latter is for managing other (non-SCCM) servers.

Client Licensing

From the managed client (endpoint) perspective, SCCM licenses are included in Microsoft Client Access License (CAL) bundles, including the Core CAL suite and the Enterprise CAL suite. CALs allow an enterprise to license end users and workstations that need to access a variety of Microsoft server technologies, such as SharePoint and Exchange. Since SCCM client licenses are included in virtually all CALs, this paper does not include those costs.

Server Licensing

A significant hidden SCCM cost is licenses for managing server endpoints. Microsoft offers Standard and Enterprise SCCM server Management Licenses, known as MLs. Both editions are similar, with the Enterprise Edition adding certain compliance and best practice capabilities. For the purposes of estimating the TCO based on the customer requirements outlined above, this paper assumes basic monitoring for 4,500 servers and advanced monitoring for 1,800 servers.

SCCM Managed Server License Costs: \$952,000

Management Server Licensing

Besides the clients and servers being managed, there are also the servers that are part of the SCCM infrastructure itself. These are licensed separately, but are often included in a variety of Microsoft server bundles.

For example, SCCM is included in System Center Management suites as well as the Enrollment for Core Infrastructure (ECI) bundles. These suites and bundles are, of course, not free, but to be fair, they are reasonably priced (\$579 for SCCM Server 2007 and \$1,321 for SCCM 2007 plus SQL Server). Because SCCM requires many remote site servers in order to scale, management server license costs skyrocket as the number of remote sites increase. In this example, which requires 32 remote servers, SCCM license costs are very high.

SCCM Management Server License Cost: \$36,000

SCCM Deployment and Maintenance Costs

Deployment represents a significant component of many software implementations. The amount of time and effort required to install, test and roll out a new service out to users translates directly into cost. Not only are costs a factor, but time to value, defined as the amount of time between initiating a project and when the organization receives business value, is also a significant consideration.

To estimate SCCM deployment costs, the following estimates were generated based on the SCCM architecture described above. Note that a discounted rate of \$255 per hour for Microsoft professional services and a “fully burdened” internal IT labor rate of \$75 an hour were used in the calculations.

| | Microsoft Services Hours | Microsoft Services Cost | Internal I/T Hours | Internal Labor Cost | Total Cost |
|---|--------------------------|-------------------------|--------------------|---------------------|--------------------|
| Project architecture and planning | 163 | \$41,000 | 163 | \$12,000 | \$53,000 |
| Server hardware, O/S install and base configuration | — | — | 384 | \$29,000 | \$29,000 |
| SCCM software installation and configuration | 192 | \$49,000 | 96 | \$7,200 | \$56,000 |
| SCCM client deployment and troubleshooting | — | — | 1,625 | \$122,000 | \$122,000 |
| Testing / QA | 96 | \$24,000 | 192 | \$14,000 | \$38,000 |
| Training (13 students at \$2,395 per student, plus 40 labor hours per student) | — | \$31,000 | 520 | \$39,000 | \$70,000 |
| Production rollout | 650 | \$166,000 | 650 | \$49,000 | \$215,000 |
| Ongoing maintenance (annual) | 1,248 | \$318,000 | 27,040 | \$2,000,000 | \$2,300,000 |
| | | | | | |
| Total Deployment Labor Costs | 1,101 | \$311,000 | 3,534 | \$365,000 | \$583,000 |
| Total Ongoing Labor Costs (per year) | 1,248 | \$318,000 | 27,040 | \$2,000,000 | \$2,300,000 |

Figure 1: Analysis of Estimated SCCM Deployment Costs for 65,000 Managed Endpoint Project

Since SCCM must scale linearly due to the requirement of remote SCCM servers at virtually every secondary location, SCCM costs increase in a very predictable way.

Summarizing SCCM Total Cost of Ownership

Adding all of the SCCM costs together paints a picture of a very expensive solution that is quite obviously not free.

- Server hardware: \$524,000
- Server operating system software costs: \$149,000
- SCCM management server licenses: \$36,000
- Training and deployment labor: \$583,000
- PKI deployment costs: \$520,000
- SCCM managed server licenses: \$952,000

Total SCCM Deployment Costs: \$2,764,000

Adding rollout costs to three years of annual maintenance costs (at \$2,300,000 per year):

Total Three-Year SCCM Costs: \$9,664,000 (\$3,221,333 per year)

Calculating SCCM TCO for Varied Deployment Sizes

Based on the figures above, plus information from Microsoft's SCCM best practices guides, a flexible TCO analysis model was created that allows five main deployment variables to be manipulated:

- Number of primary and secondary locations;
- Number of managed servers and workstations;
- Average IT labor rate (default of \$75)

The model then outputs SCCM TCO data, which shows some very interesting trends. Since SCCM must scale linearly due to the requirement of remote SCCM servers at virtually every secondary location, SCCM costs increase in a very predictable way. To illustrate, SCCM TCO was determined for five different deployments, as follows:

- **Scenario #1:** one (1) primary location; 10 secondary locations; 4,950 workstations and 50 servers under management (total of 5,000 endpoints)
- **Scenario #2:** one (1) primary locations; 25 secondary locations; 24,750 workstations and 250 servers under management (total of 25,000 endpoints)
- **Scenario #3:** three (3) primary locations; 50 secondary locations; 45,000 workstations and 5,000 servers under management (total of 50,000 endpoints)
- **Scenario #4:** five (5) primary locations; 250 secondary locations; 99,000 workstations and 1,000 servers under management (total of 100,000 endpoints)
- **Scenario #5:** ten (10) primary locations; 500 secondary locations, 198,000 workstations and 2,000 servers (a total of 200,000 endpoints)

| Scenario | Primary Locations | Secondary Locations | Managed Workstations | Managed Servers | Total Endpoints | Server Hardware | Server Software | SCCM Software | PKI | Deployment Labor | Annual Maint. Labor | 3-Year TCO |
|----------|-------------------|---------------------|----------------------|-----------------|-----------------|-----------------|-----------------|---------------|--------|------------------|---------------------|------------|
| 1 | 1 | 10 | 4,950 | 50 | 5K | \$247K | \$69K | \$30K | \$40K | \$92K | \$180K | \$1.0M |
| 2 | 1 | 25 | 24,750 | 250 | 25K | \$611K | \$174K | \$91K | \$200K | \$321K | \$902K | \$4.1M |
| 3 | 3 | 50 | 45,000 | 5,000 | 50K | \$1.2M | \$336K | \$895K | \$400K | \$633K | \$1.8M | \$8.9M |
| 4 | 5 | 250 | 99,000 | 1,000 | 100K | \$5.8M | \$1.6M | \$658K | \$800K | \$2.0M | \$3.6M | \$21.7M |
| 5 | 10 | 500 | 198,000 | 2,000 | 200K | \$11.5M | \$3.2M | \$1.3M | \$1.6M | \$4.1M | \$7.2M | \$43.3M |

Figure 2: Analysis of Estimated SCCM TCO for Multiple Use Cases

Conclusion

While the primary focus of this paper was to disprove the notion of free software using Microsoft SCCM as an example, it can also be used to evaluate offerings from multiple vendors against one another from a TCO perspective.

As a comparative data point, BigFix provides superior System Lifecycle Management functionality than SCCM at a fraction of the TCO, providing value in weeks rather than months.

To summarize the advantages of the BigFix solution over SCCM, BigFix:

- Manages up to 250,000 endpoints with a single server (hundreds or even thousands fewer than SCCM)—saving over \$11M in hardware costs and over \$3M in management server software costs
- Requires no server or endpoint certificates, saving hundreds of thousands of dollars in PKI costs (encryption keys and digital signatures are built in to the BigFix solution, requiring no additional deployment or costs)
- Deploys in weeks, requiring 10% of the SCCM labor, saving hundreds of thousands or millions of dollars in deployment costs
- Requires, on average, a single FTE to manage up to 100,000 endpoints and only ½ FTE per 50,000 endpoints beyond 100,000, saving scores of FTEs and millions of dollars per year in labor and training costs

The secret to the BigFix solution is the BigFix platform, which continuously discovers, assesses, remediates, and enforces the health and security of servers, desktops, and roaming laptops in real time via a single, policy-driven agent and single console.

BigFix patented technology distributes computing power to the devices themselves, using the intelligent BigFix Agent to provide a level of visibility and control that is not possible in legacy solutions. This level of innovation translates into significant advantages in speed, flexibility, and scalability, while reducing the infrastructure and training costs associated with traditional systems and security management.

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Regardless of the size of the deployment, BigFix saves substantial amounts of money compared to the "free" SCCM solution. For the small 5,000-endpoint deployment described above, BigFix saves \$223,000 over five years, and the savings increase exponentially as the deployment size grows. BigFix savings for the 200,000-endpoint deployment described above are astounding: \$32.8M over three years and \$47.0M over five years—81% lower TCO than SCCM!

For more information on how your organization can leverage BigFix, to schedule a demo, or to download a free trial, visit www.bigfix.com.

BigFix: Breakthrough Technology, Revolutionary Economics

Founded in 1997, BigFix[®], Inc. is a leading provider of high-performance enterprise systems and security management solutions that revolutionizes the way IT organizations manage and secure their computing infrastructures. Based on a unique architecture that distributes management intelligence directly to the computing devices themselves, BigFix is radically faster, scalable, more accurate and adaptive than legacy management software. From Systems Lifecycle Management, Security & Vulnerability Management to Endpoint Protection, BigFix solutions automate the most labor-intensive IT tasks across the most complex global networks saving organizations significant amounts of time, labor, and expense. BigFix provides real-time visibility and control for millions of globally distributed computing devices.

The BigFix customer list counts many of the world's largest and most prestigious organizations in every industry including financial services, retail, education, manufacturing, and public sector agencies. More information can be found at www.bigfix.com.