State of Ohio IT Guideline	ITG-PLF-08 Attachment A	Server/Desktop Virtualization ROI TCO Calculator
Effective Date: December 1, 2010 **Effective Period:** 12 months	***This appendix is subject to change based on programmatic changes and updates that vendors issue from time to time.***	

VMware ROI TCO Calculator Instructions and Value Recommendations

Introduction[1]

VMware's Return on Investment Total Cost of Ownership (ROI TCO) Calculator is designed to provide a total cost of ownership analysis that compares the current environment to a virtualized environment. It addresses two virtualization activities:

- Server virtualization
- Desktop virtualization

The ROI TCO Calculator is available on VMware's Web site in the form of a multi-page spreadsheet. Data entries include the number of servers intended for virtualization; person-hours to provision a new server; and existing storage requirements. Default assumptions about cost and other variables are based on VMware research. The default values used in the ROI TCO Calculator represent a starting point and should be changed to actual or "better" data that would reflect more accurately an agency's current situation.

The ROI TCO Calculator is on VMware's Web site at http://roitco.vmware.com/vmw/Account/. Although its actual location on the VMware Web site may change from time to time, it can be found with the materials that describe virtualization, or by searching for the phrase, "Calculate Your Cost Savings."

The tool is represented as multiple sequential forms.

Profile

The selections made in the "Profile" section sets the structure for the questionnaire and sets default values particular to the selections. For server virtualization, choose the following (see Figure 1):

- Select the "Server Virtualization" option under "Create a New Analysis";
- Select "North America" from the "Region" dropdown list;
- Select "United States" from the "Site Location" dropdown list; and
- Enter a name in the "Name the Analysis" field.

Each analysis can be saved for future use. Analyses are listed under "My Saved Analysis." Note that this tool can provide useful information, not only for an initial implementation, but also for additional phases of implementation after a virtualization project has begun.

Click the "Continue" button at the bottom of the Web page to move to the first page of the analysis.

[1] VMware upgraded their ROI TCO Calculator after the SSVC WG had completed their recommendation. This document applies the recommended guidelines to the new version.

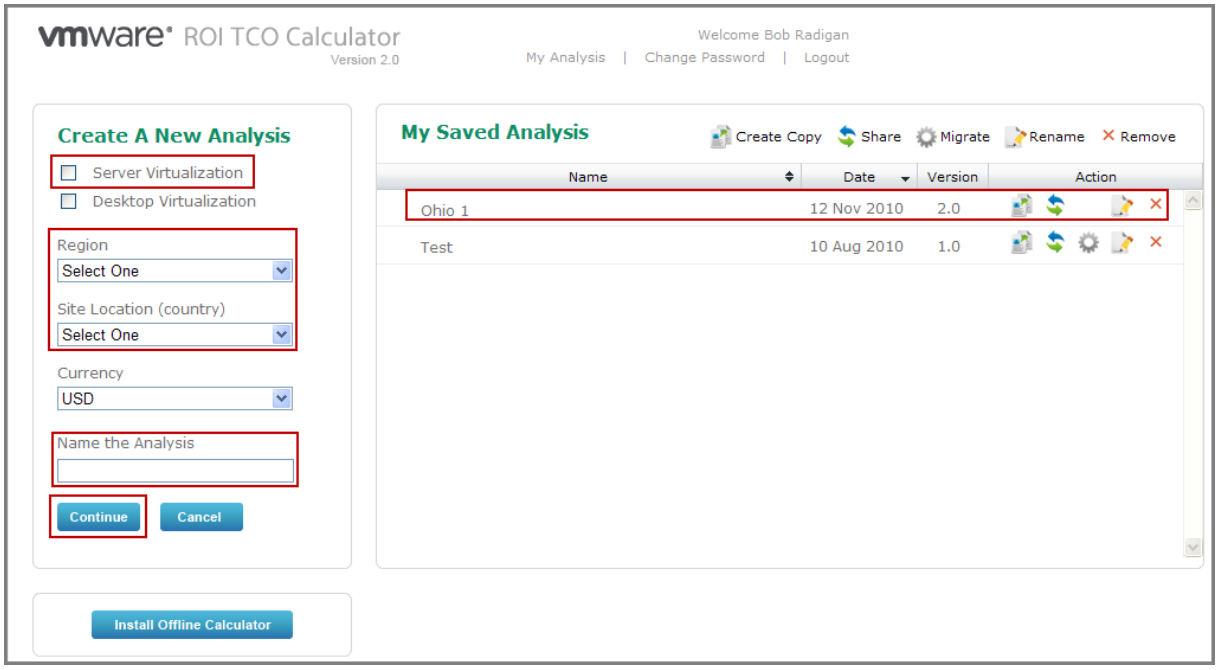


Figure 1. The "Profile" section of the VMware ROI TCO Calculator

Analysis

Each page of the calculator gathers information about the current IT environment and intentions. The progression of sequential functions is shown by a progress bar that starts with "1 Server Configuration" and ends with "5 ROI." (See Figure 2.) The use and purpose of these functions are described below.

The current step on the progress bar is highlighted in blue. Many of the fields contain default values based on research that includes industry, regional and best practice findings, as shown in Figure 2.

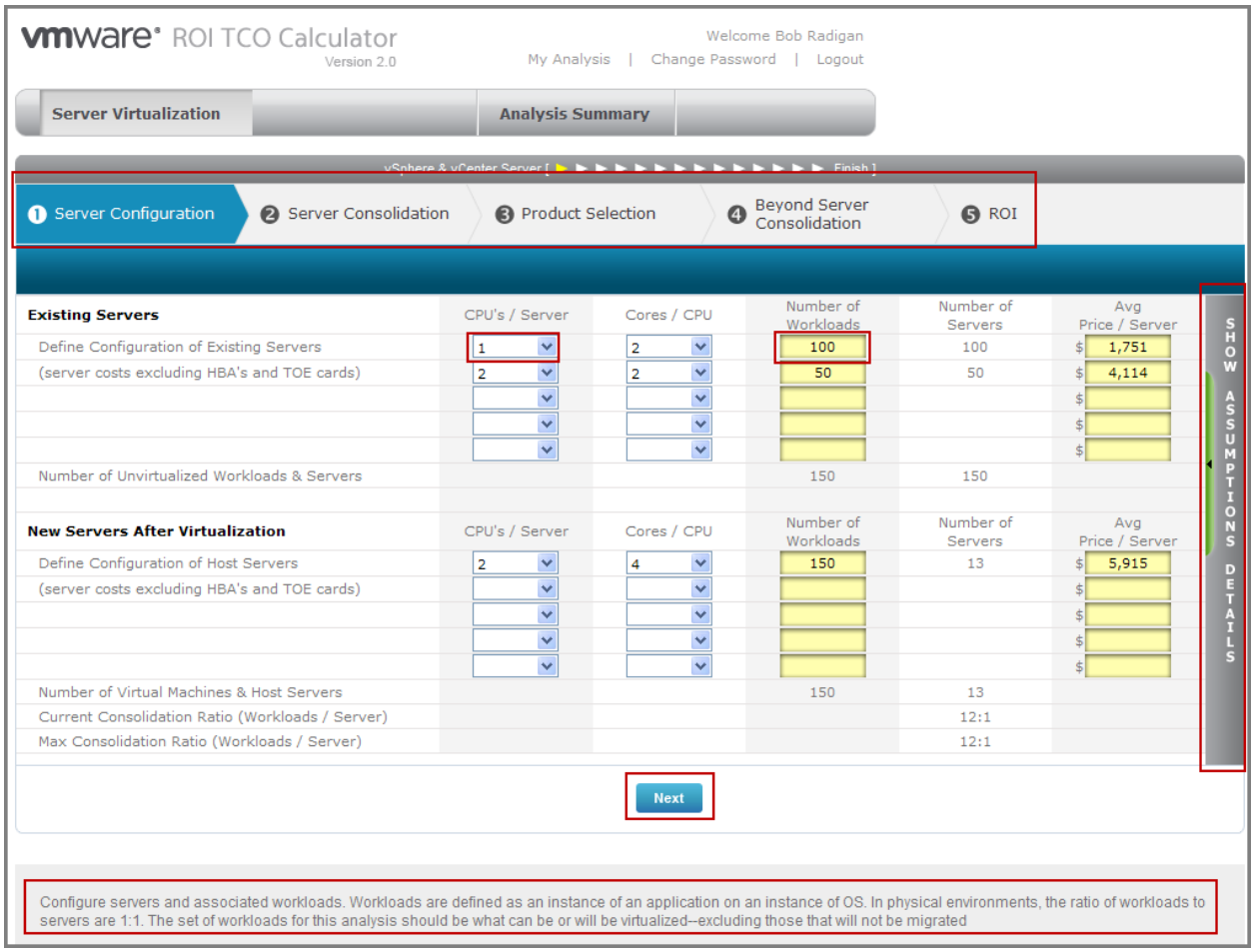


Figure 2. First Server Configuration page

Agencies are encouraged to enter values that are representative of their environment when the values are known or are relatively easy to obtain. The gray highlighted area at the bottom of the screen contains a description of the data required along with any guidance useful for completing the function.

Depending on the field, change the default values/parameters/assumptions either by selecting values from a drop-down list, by entering a value in a yellow highlighted field, or by clicking the "Show Assumption Details" green bar to open the assumptions window. The resulting window (see Figure 3) shows the pertinent variables and their values.

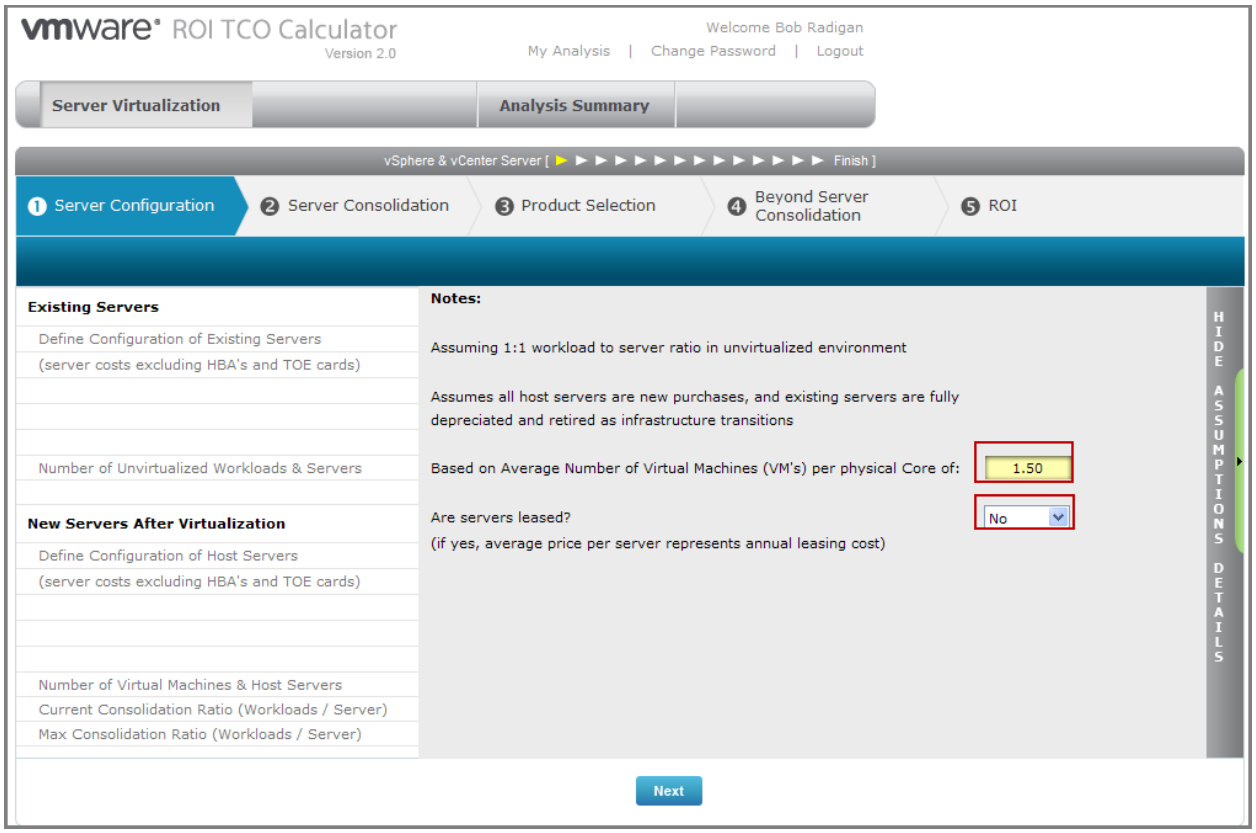


Figure 3. Server Configuration assumptions

The Server/Storage Virtualization & Consolidation Work Group (SSVC WG) reviewed the variables used in the ROI TCO Calculator and concluded that the default values for several variables should be changed to reflect "real" values to avoid producing an overly optimistic result. The SSVC WG recommends that agencies spend the time to become familiar with the variables and their underlying assumptions to have confidence in the outcomes.

Agencies should pay particular attention to the variables listed below, because the default values could unduly affect the results of the analysis:

- **1: Server Configuration: Assumption Details**
  Based on Average Number of Virtual Machines (VMs) per physical Core of *(see Figure 3):*
  - *Default value is 1.50.*
  - *Recommended value is at least 2.00 and in some cases could be as high as 3.80 (at this writing).*
- **2: Server Consolidation: Virtualization Schedule**
  Virtualization Schedule (% workloads virtualized), entries for 5 years *(see Figure 4)*
  - *Default is 100%.*
  - *Most agency experience suggests that an incremental or phased approach over time is more realistic, noting that the first and second years are seldom 100%.*

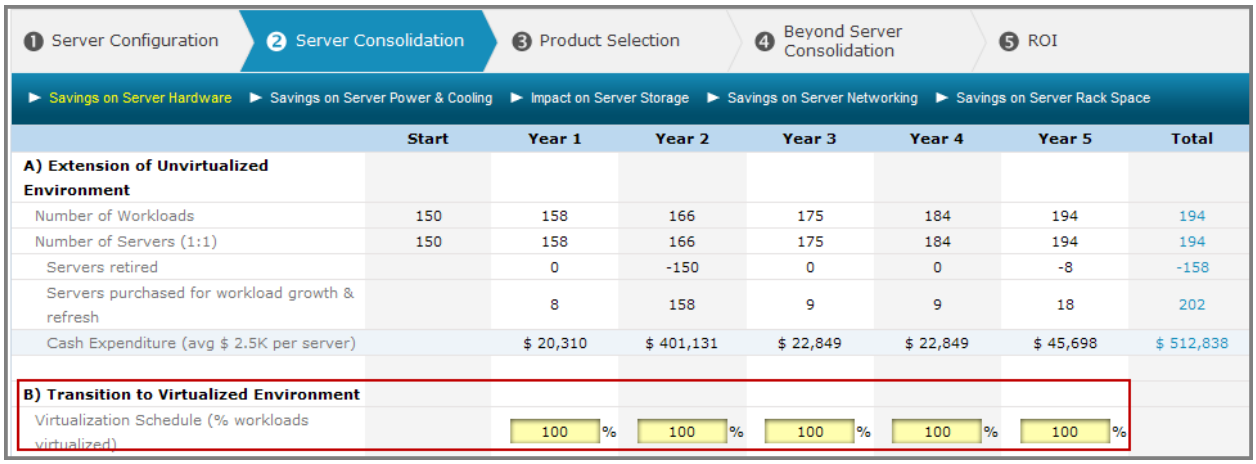


Figure 4. Server Consolidation: "Savings on Server Hardware" screen

- **2: Server Consolidation: Power Rate assumptions**
  - *Default is $0.100 in both instances (see Figure 5).*
  - *Agencies should use a rate based on their specific facility. For example, the rate for the SOCC in 2009 was $0.067.*

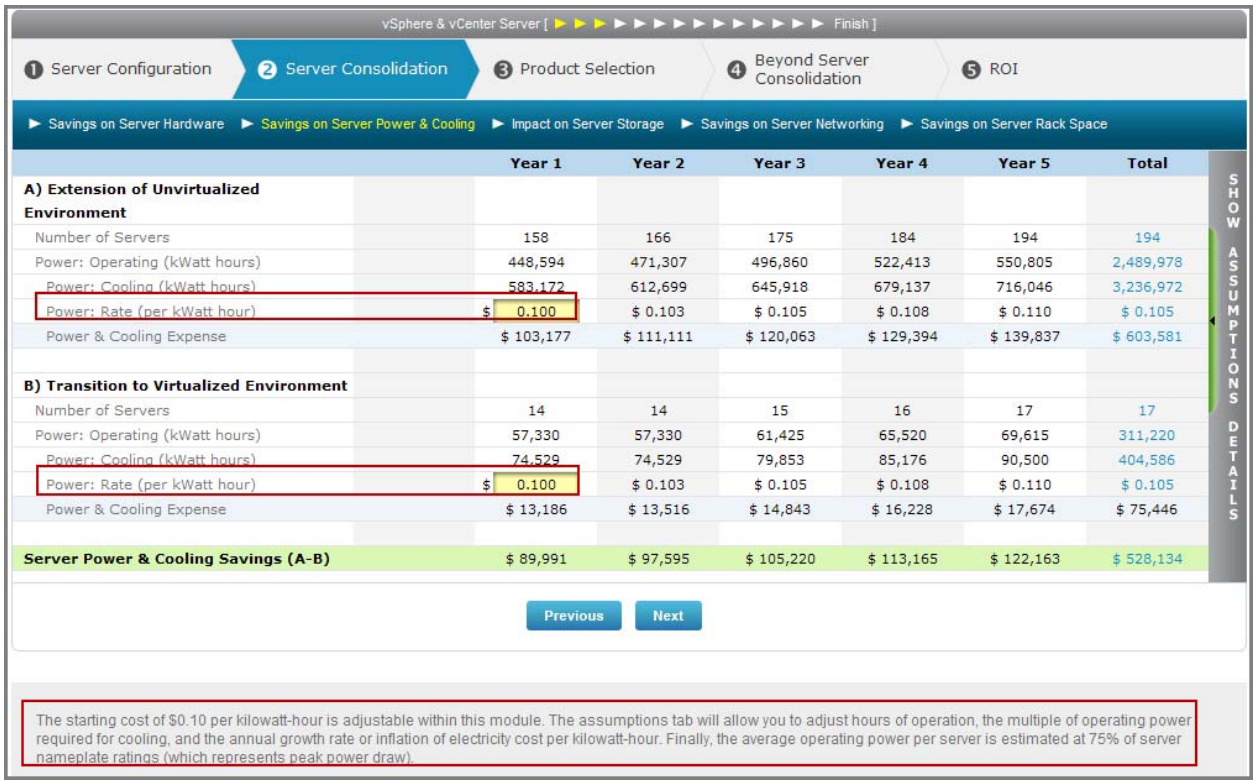


Figure 5. Server Consolidation: "Server Power & Cooling Savings" screen

Note that the assumption details for this screen support further adjustment based on actual agency operations and the number of servers deployed *(see gray area at the bottom of Figure 5).* Attention to power details can avoid significant distortions in calculations and outcomes *(see Figure 6).*

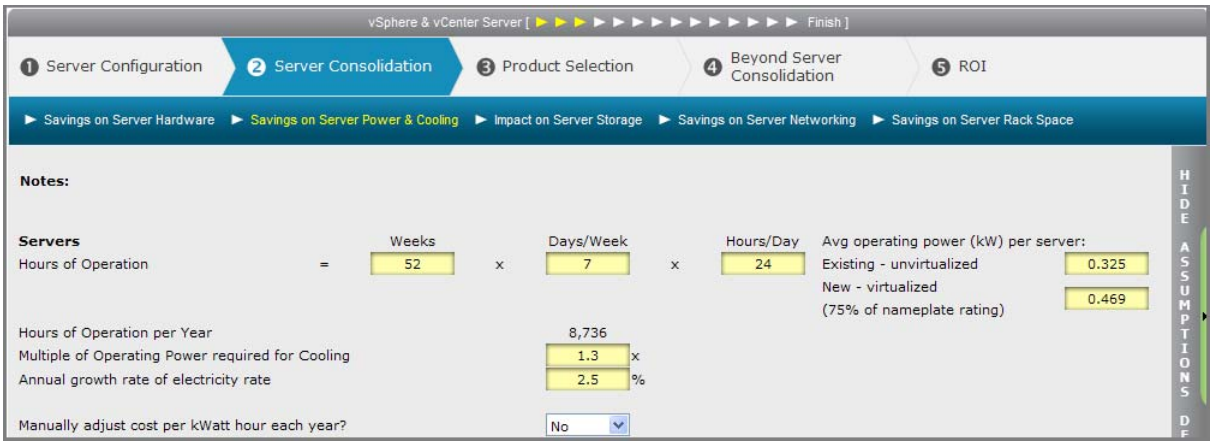


Figure 6. Server Consolidation: power details screen

- **2: Server Consolidation: Savings on Server Networking, Assumption Details**
  - *Agencies should change the default network switch configuration values to reflect their environments (see Figure 7).*

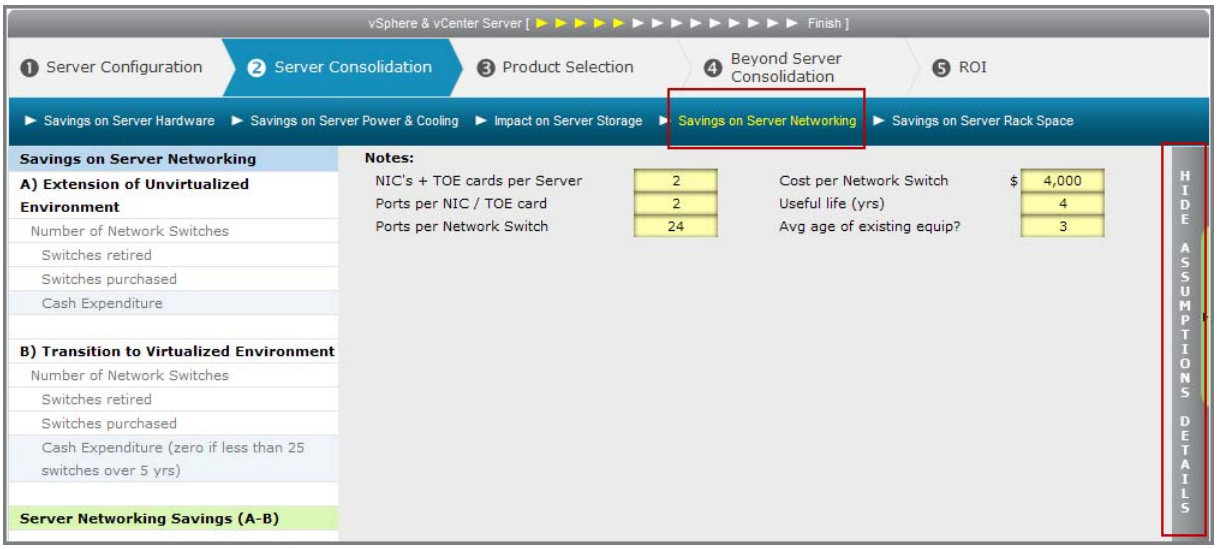


Figure 7. "Savings on Server Networking" screen

- **3: Product Selection: Choose "You know the vSphere edition you need" and Enterprise +**
  - *Most agencies should select the current software version for planning purposes, Enterprise+ at this writing (see Figure 8).*

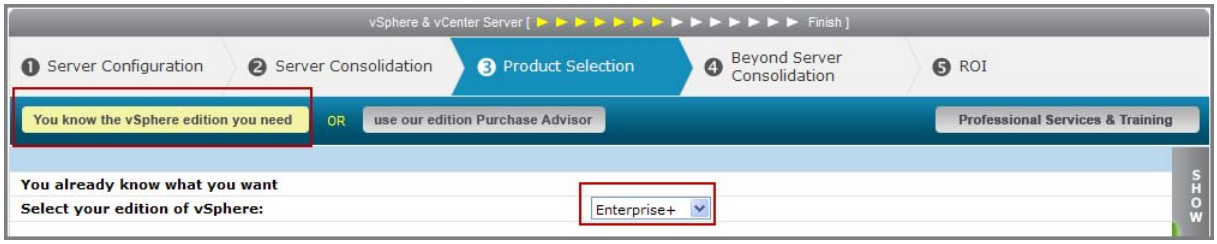


Figure 8. Product Selection screen

- *Open "Show Assumption Details" to adjust for the state's discount, which is significant and will affect the outcome of the analysis (see Figure 9).*
- *Select "Other" from the "Discounts?" drop-down list and enter "70" in the "% of License:" field and "35" in the "% of SNS:" field. These numbers represent the discounts available through the state's VMware Enterprise Purchase Program – 70% discount for software licenses and 35% for platinum maintenance (SNS). A current product order form that includes products and prices is available by contacting State.ITStandards.Manager@oit.ohio.gov.*
  - *If all VMware software costs are known, then enter them for each year instead of using the calculated estimate.*

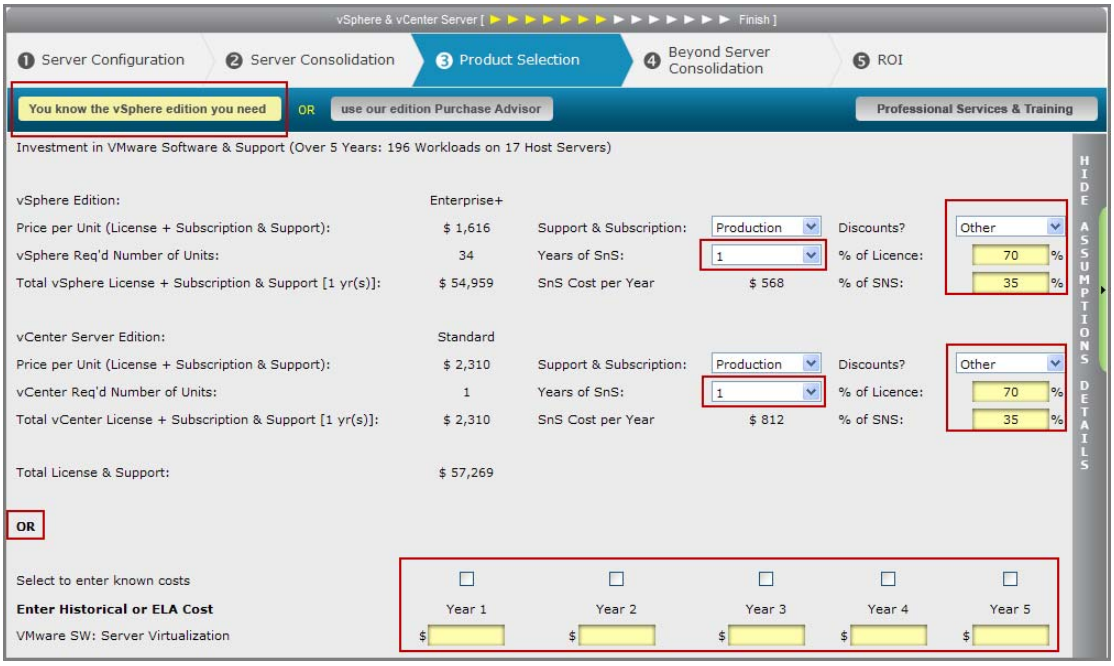
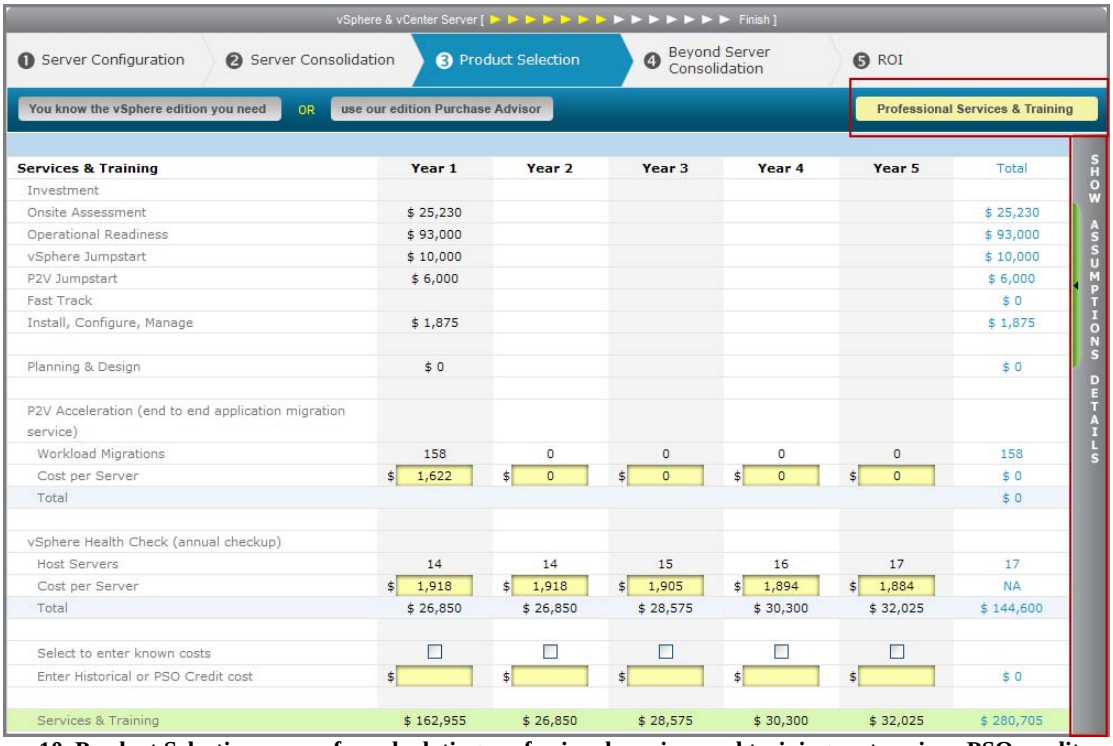


Figure 9. Product Selection screen with price estimate assumption details

- **3: Product Selection: Professional Services & Training**

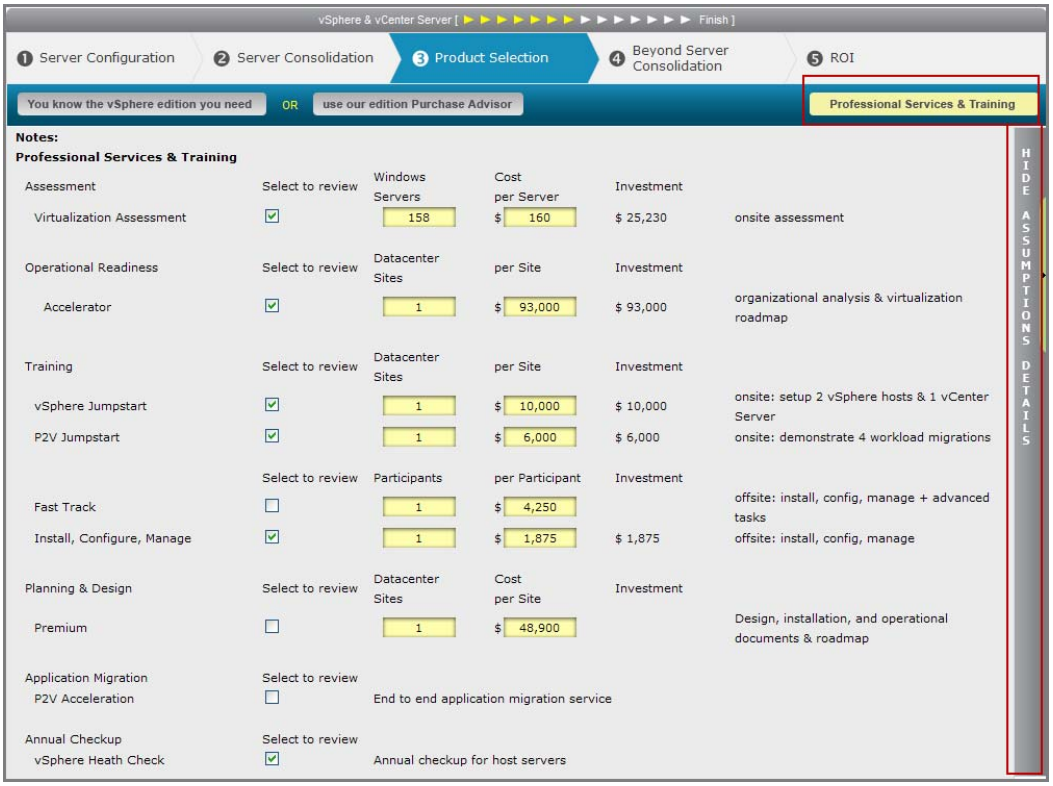
  This screen (see Figure 10) provides a framework for calculating costs for professional services for implementation assistance and training.
  - *Consult with our VMware representative for a clear understanding of these services and adjust according to need. Professional services (PSO) credits are the pricing units VMware uses for determining support and training course fees. The state's VMware Enterprise Purchase Program offers PSO credits at a 16% discount off of the commercial list price. You can obtain the current PSO credit price from the order form, which is available from State.ITStandards.Manager@oit.ohio.gov.*



Services & Training	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Investment						
Onsite Assessment	$ 25,230					$ 25,230
Operational Readiness	$ 93,000					$ 93,000
vSphere Jumpstart	$ 10,000					$ 10,000
P2V Jumpstart	$ 6,000					$ 6,000
Fast Track						$ 0
Install, Configure, Manage	$ 1,875					$ 1,875
Planning & Design	$ 0					$ 0
P2V Acceleration (end to end application migration service)						
Workload Migrations	158	0	0	0	0	158
Cost per Server	$ 1,622	$ 0	$ 0	$ 0	$ 0	$ 0
Total						$ 0
vSphere Health Check (annual checkup)						
Host Servers	14	14	15	16	17	17
Cost per Server	$ 1,918	$ 1,918	$ 1,905	$ 1,894	$ 1,884	NA
Total	$ 26,850	$ 26,850	$ 28,575	$ 30,300	$ 32,025	$ 144,600
Select to enter known costs	☐	☐	☐	☐	☐	
Enter Historical or PSO Credit cost	$	$	$	$	$	$ 0
Services & Training	$ 162,955	$ 26,850	$ 28,575	$ 30,300	$ 32,025	$ 280,705

Figure 10. Product Selection screen for calculating professional services and training costs, minus PSO credits

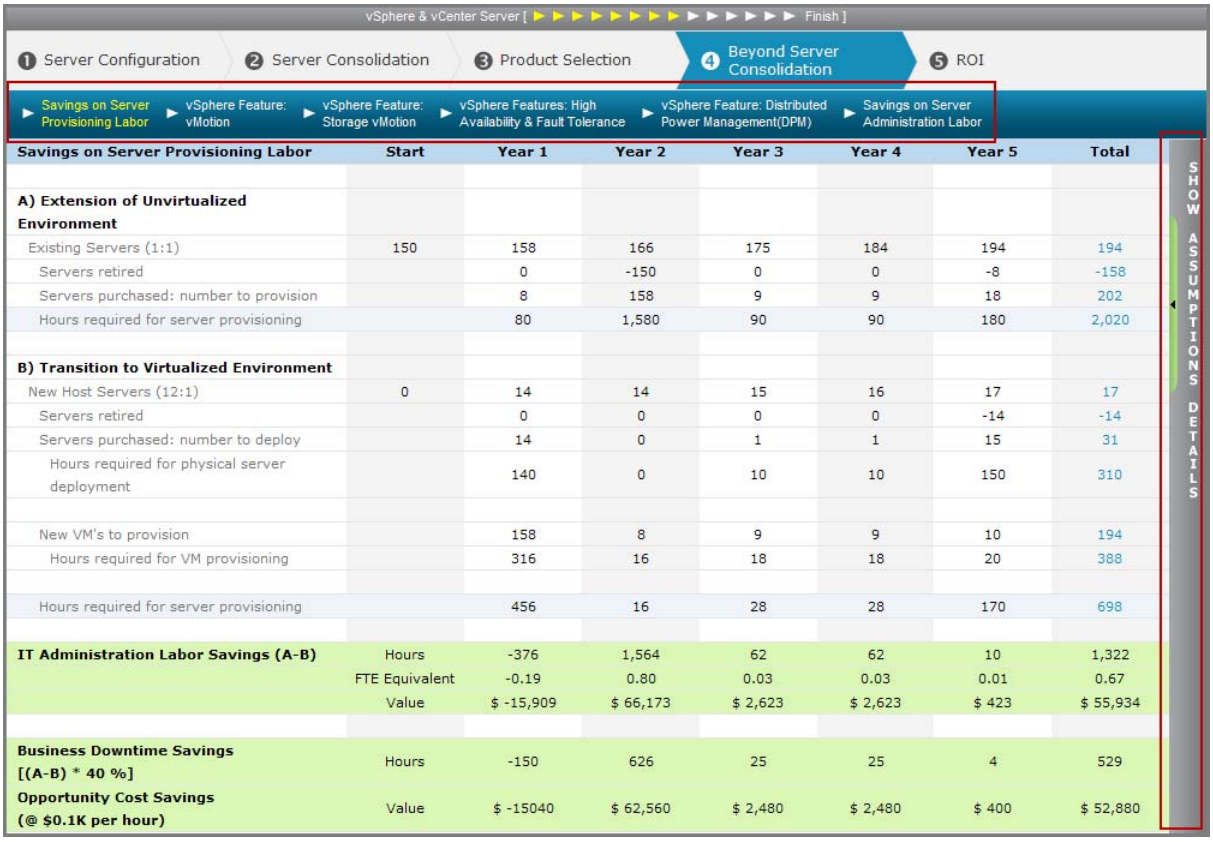
Click “Open Assumption Details” to adjust component variables. Variables and default figures are shown in Figure 11.



Assessment	Select to review	Windows Servers	Cost per Server	Investment	
Virtualization Assessment	☑	158	$ 160	$ 25,230	onsite assessment
Operational Readiness	Select to review	Datacenter Sites	per Site	Investment	
Accelerator	☑	1	$ 93,000	$ 93,000	organizational analysis & virtualization roadmap
Training	Select to review	Datacenter Sites	per Site	Investment	
vSphere Jumpstart	☑	1	$ 10,000	$ 10,000	onsite: setup 2 vSphere hosts & 1 vCenter Server
P2V Jumpstart	☑	1	$ 6,000	$ 6,000	onsite: demonstrate 4 workload migrations
	Select to review	Participants	per Participant	Investment	
Fast Track	☐	1	$ 4,250		offsite: install, config, manage + advanced tasks
Install, Configure, Manage	☑	1	$ 1,875	$ 1,875	offsite: install, config, manage
Planning & Design	Select to review	Datacenter Sites	Cost per Site	Investment	
Premium	☐	1	$ 48,900		Design, installation, and operational documents & roadmap
Application Migration	Select to review				
P2V Acceleration	☐	End to end application migration service			
Annual Checkup	Select to review				
vSphere Heath Check	☑	Annual checkup for host servers			

Figure 11. Professional services and training assumptions

- **4: Beyond Server Consolidation**
  By using this set of six screens, you can customize parameters so the information will be more specific to your agency's environment and operational characteristics (see Figure 12). These details can produce a more meaningful ROI and/or TCO, but it may take additional effort to determine accurate figures for the variables, such as Administration Labor cost per hour.



Savings on Server Provisioning Labor	Start	Year 1	Year 2	Year 3	Year 4	Year 5	Total
A) Extension of Unvirtualized Environment							
Existing Servers (1:1)	150	158	166	175	184	194	194
Servers retired		0	-150	0	0	-8	-158
Servers purchased: number to provision		8	158	9	9	18	202
Hours required for server provisioning		80	1,580	90	90	180	2,020
B) Transition to Virtualized Environment							
New Host Servers (12:1)	0	14	14	15	16	17	17
Servers retired		0	0	0	0	-14	-14
Servers purchased: number to deploy		14	0	1	1	15	31
Hours required for physical server deployment		140	0	10	10	150	310
New VM's to provision		158	8	9	9	10	194
Hours required for VM provisioning		316	16	18	18	20	388
Hours required for server provisioning		456	16	28	28	170	698
IT Administration Labor Savings (A-B)	Hours	-376	1,564	62	62	10	1,322
	FTE Equivalent	-0.19	0.80	0.03	0.03	0.01	0.67
	Value	$ -15,909	$ 66,173	$ 2,623	$ 2,623	$ 423	$ 55,934
Business Downtime Savings [(A-B) * 40 %]	Hours	-150	626	25	25	4	529
Opportunity Cost Savings (@ $0.1K per hour)	Value	$ -15040	$ 62,560	$ 2,480	$ 2,480	$ 400	$ 52,880

Figure 12. Opening screen for Beyond Server Consolidation variables

- **5: ROI: TCO Calculator, Review Possible Additional Savings**
  The ROI TCO Calculator provides scenarios for estimating the impact of deploying additional VMware products for management. This section is optional, but may provide additional savings if additional VMware products are desired. If additional VMware products are desired, click Review Possible Additional Savings (see Figure 13).

- You have completed the Server Virtualization portion of this session of the VMware ROI TCO Calculator. At this time you may review and record results. Your session will be saved for future use.

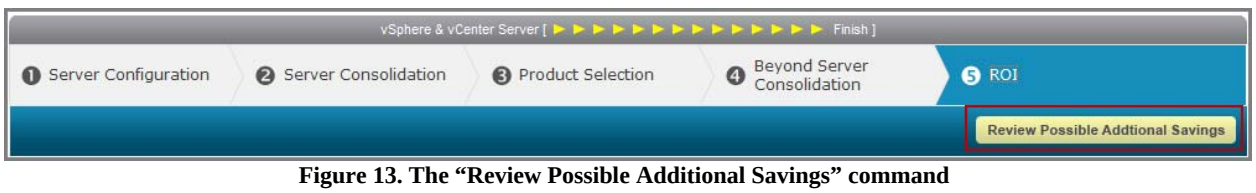


Figure 13. The "Review Possible Additional Savings" command