IMPROVING SOFTWARE TESTING EFFICIENCY USING AUTOMATION METHODS

A Project Report

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By

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Abstract

Global economic downturn and the increased complexity of next generation telecom equipments are demanding telecom equipment vendors to adopt to cost effective, faster, reliable, and efficient methods to test their products. Automation testing provides many improvements over traditional methods of manual testing and many equipment vendors are introducing test automation to validate their products. In this project, we have analyzed and developed an automation testing method that is required for software testing over telecom network elements. The test results after executing test automation validated that the automation testing provides significant improvements over manual testing. Further, this report provides the business and technical aspects for creating a versatile automation framework for telecom industry that will increase the software testing efficiency, reliability, and accuracy.
We would like to express our deepest gratitude to Professor Dr. Jim Dorosti, Department of General Engineering, San Jose State University and Mr. Surya Rao, Senior Manager, Tellabs for the generous guidance and support provided to us in completing the project. The directions and guidelines provided by both our advisors were highly valuable and helped us successfully complete this project.

Further, we would like to extend our sincere gratitude to Professor Dr. Leonard P. Wesley, MSE Director, San Jose State University for giving us an opportunity to pursue ENGR 298 course under his guidance, precious suggestions, and advice.

- Suresh Thuravupala
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1 Introduction

With the increase in complexities for today’s telecommunication network elements, the growing trend among network element manufactures is to adapt to newer methods such as test automation to ensure quality of their products. Test automation is one of the key areas for improvement in many companies and companies are developing customized solutions to test their products. However, this approach lacks wider acceptance since the automation tool developed is not versatile enough and cannot address multidimensional demands. There is no generalized tool available for test automation, but the work is in progress to develop such framework by many software vendors. In our project, we will examine the importance of automation testing and provide the advantages that a network element vendor can gain by adapting to test automation methods. We developed a test automation framework for our industrial sponsor’s (Tellabs) network element, 8800 series Multi Services Router (MSR). The Tellabs 8800 MSR is a next generation high-end router used by many telecom and network service providers worldwide for carrier-class services. The 8800 MSR processes data in the Layer-2 and Layer-3 layers of the OSI (open systems interface) seven layer topology. In addition to the development for test automation, this document also covers economic justification for test automation framework for telecom networking elements.
1.1 Purpose

The purpose of this project is to create a test automation framework for testing the network elements of Tellabs’s 8000 series router. The developed test automation will be executed over Tellabs 8800 series router to evaluate the advantages of automated testing such as cost savings, increased productivity, and testability in testing the telecom network elements. Creation of test automation for testing scalable and difficult scenarios such as 2000 interfaces is the main goal for this test automation development. The test framework developed as part of this project uses Tellabs routers as a test bed, but commercializing it for other network elements is an option. This project work also intents to evaluate economic justification and identify the return on investment (ROI) on automating the software testing of the telecom network elements.

1.2 Scope

The scope of our project work covers development of the automation test framework required for testing Tellabs 8800 series MSR router. Using the developed software code, we will validate the results against our baseline requirements. Further, we will justify the economic viability of our test automation development project and develop a business plan to market the test automation product.

2 Hypothesis

Today’s advanced telecom and networking equipment gears have complex features that require thorough validation and testing before introducing to the field.
Telecom and networking equipment vendors cannot afford manually testing their equipments since it takes too much time and resources. Equipment vendors are introducing more automation in their development and regression testing. Automation testing of software systems provides a more cost effective and efficient solution. Automation testing is very reliable and it provides accurate results that are difficult to manipulate.

2.1 Verification of the Hypothesis

In order to validate the hypothesis an automation framework was developed, the developed scripts and library files were tested and validated using the automation framework. Software automation testing executed on Tellabs-8800 series router and the test results computed. The feature that we identified in coordination with the industrial sponsor was a scalable network topology with 2000 IP (Internet protocol) interfaces on Tellabs 8800 MSR. The results recorded for manual testing versus automation testing proved that the automation testing provides significant improvement over manual testing. The section-7 “Automation Testing Implementation” provides details of the recorded parameters and computations for verification of the hypotheses.

3 Automation Testing

“Automated testing uses a computer system to send commands and receive responses from telecom network elements. Tests can be run unattended and results are recorded in a log file for analysis and test report generation. A telecom network element
may be supporting hundreds of features and each feature may have hundreds of test cases to verify. With the challenges in today’s networking or telecommunication market, the reduced development cycle times have become a necessity for a particular company’s survival. This makes test automation a critical strategy for high tech organizations involved in the development and production telecom equipments. In the past equipments manufactures had to deal with less complex situations which were easy to handle manually, but with the explosive pace of complexities of today’s market requirements, test automation is necessary to ensure satisfactory test coverage and for reducing risk.” (Suresh Thuravupala, 2008).

**Scripting Languages**

There are many scripting languages such as TCL, PERL, and PYTHON etc. that are used for automation development. The scripting languages help the developer to create various library files and modules. These libraries and script modules help to run test cases and to validate functionalities of the software under test.

**TCL Language**

TCL is the scripting language used for developing this test automation project. TCL stands for "Tool Command Language", TCL is a scripting language used for developing many computer applications. “TCL has native support of all APIs needed for test development, such as network management and package generation” (Carl, 1998). TCL is "available for distribution". TCL is easy to learn and use. That is why users can develop TCL scripts just by learning application related commands. “This allows user to customize or add new functionality into existing application. It runs on multiple
operating systems such as "windows 98, XP, Vista, Linux, Solaris, and Mac OS". TCL allows “rapid development” because TCL is interpreted language. There is no need to recompile code every time as changes are made.” (Carl, 1998).

TCL allows us to make C procedure available to use. TCL has many extensions and set of applications that are useful for test script development. “EXPECT” an extension of TCL is highly recommended for test development because it allows user to write interactive script. "EXPECT is a TCL program that plays back responses to interactive, character-based programs. Test developers write scripts to instruct expect what output to listen for during the session and what responses to send back. EXPECT can be used to automatically control programs such as FTP, telnet, rlogin, and tip. Since most all network devices support telnet access, it can be used to automate remote configuration via telnet.” (Carl, 1998). TCL is open source, means its source code is freely available and any developer can modify it.

4 Test Automation Framework

The test automation framework that we plan to implement in our project has the following functional blocks:

1. Test Execution Engine
2. Test Case /Test Suit
3. Results
4. Test Bed
5. Scripts file
6. Setup File

These functional blocks interconnect to form the proposed automation framework for our project. The Figure-1, below depicts the framework or the architecture of the automation tool that we plan to develop for testing our industrial sponsor’s router product.

![Diagram of Automation Framework]

**Figure 1: Automation framework**
Source: (Suresh Thuravupala, 2008)

### 4.1 Design Specification for the Automation Framework

In order to measure the success of the framework a baseline needs to be identified, that will be developed to automate the testing of the software features on the 8800 router. This baseline or set of specification will help to measure whether the
framework meets the desired goal. The specifications that the automation framework will require to achieve are the following:

1. Time saving of 80% or better
2. Accuracy of 95% or better
3. Cost Saving of 40% or better
4. Productivity increase of 350% or better

### 4.2 Automation test set up

The figure below shows the automation set up for testing the Tellabs 8800 test bed that will comprise of one or more of 8800 series router, test instruments, and traffic generator etc. QA engineers will store test script files and library files on the UNIX server machine.

![Automation Test Set up Diagram](image-url)

**Figure 2: Automation Test Set up**
Test scripts creates telnet session with 8800 series router and sends CLI commands to the router and based on response from the router test scripts store results in the “Test Result file” and “Log files”.

5 Product Description

The figures below show the picture of a Tellabs 8800 series router, used as the device under test (DUT) for this project. “The Tellabs 8800 Multiservice Router (MSR) series is a next-generation multi-service edge router built to deliver high-performance, carrier-class service.

Figure 3: The Tellabs 8860 Multiservice Router
(Source: Tellabs (2009))

The Tellabs 8800 MSR Series supports any-to-any Layer 2 network and/or service interworking reliably and concurrently. It provides service providers a graceful migration path to a converged MPLS-enabled IP network. The Tellabs 8800 MSR Series enables
connection-oriented network characteristics such as QoS (Quality of Service) and security with powerful MPLS traffic engineering capabilities while maintaining the superior scalability and flexibility of pure IP networks.”  (Tellabs, 2009). The 8800 MSR, which acts as a network element processes data protocols for switching and routing at the data link and the network level. These processes run with the help of highly complex embedded software running advanced switching and line cards of the system’s hardware. At the software, level the 8800 MSR supports most advanced features of the Ethernet, ATM, FR and IP routing. The user interface hardware that 8800 MSR supports range from OC3, OC12, OC48, OC192, Gigabit Ethernet etc. modules. The automation software that we developed interfaces with the user modules such as OC3, OC12, OC48, OC192, or Gigabit Ethernet and configure the system with various Layer-2 and Layer-3 features for data transmission.

“The Tellabs 8800 MSR Series is available in three chassis sizes , 6 slots (Tellabs8830), 15 slots (Tellabs8840) and 19 slots (Tellabs8860), all of which share a wide range of interfaces with unmatched service flexibility. The Tellabs 8860 Multiservice router shown in Figure 3 above combines Layer 2 switching and QoS capabilities with the flexibility and intelligence of Layer 3 routing.”  (Tellabs, 2009).

6 Advantage of Automation testing

Automation testing provides many advantages and some of them are listed below which are highly relevant for telecom network element test automation.
6.1 Reduced test cycle time

Network Elements used in telecommunication networks consist of many pieces of hardware and software components. In order to cater to the demands of the customer, the equipment manufactures create hundreds of software features running on network elements. The manufacturers test each of these software features against the requirements documented in FRD (Feature Requirement Document) or PRD (Product Requirement Document). Validating this as part of the quality assurance process will take many days of manual testing. It is in this context the importance of automation testing is emphasized. Automation testing can considerably reduce the testing time and in most cases a reduced test cycle time up to 50% or more is possible.

6.2 Repeated testing

During development of a telecom network element, developers test a software feature multiple times - first at unit level, followed by fully integrated software level, then feature development or system testing and finally, in regression testing. Manually testing a feature so many times consumes company’s resources and increases the cost at each stage. Instead, developing an automation script at the initial stage enables repeating tests any number of times while saving the cost and other resources for testing.
6.3 Avoiding errors

“Often human errors happen during manual testing, where as such errors in observations and calculations can be avoided by automating test cases. Further, there are chances that manual testing in an uncontrolled environment may manipulate the results. Automation testing avoids any chance of data being manipulated.” (Suresh Thuravupala, 2008).

6.4 Testing complex scenarios

Testing multiple network elements in large network topologies, stress, scalability, boundary conditions involves many days of planning and configurations. Since manual testing has many practical limitations, automation testing is well suited in such scenarios. A well-written automation code for creating four network interfaces extends very easily for testing eight, sixteen, or sixteen hundred interfaces. The same code runs over one or many number of network elements by changing the target IP addresses or any other parameters. Thus, automation testing simplifies testing over thousands of network interfaces or connections for complex testing scenarios.

6.5 Cost benefits

The analysis below shows the saving potential when companies adapt to test automation. In this analysis, a company employing 50 manual test engineers spends huge amounts from Year-1 to Year-5. The comparison of cost for manual and automation testing shows automation has huge cost benefits.
<table>
<thead>
<tr>
<th></th>
<th>Year-1</th>
<th>Year-2</th>
<th>Year-3</th>
<th>Year-4</th>
<th>Year-5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of test engineers</strong></td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td><strong>Annual Salary in $ millions</strong></td>
<td>$5.500</td>
<td>$5.500</td>
<td>$5.500</td>
<td>$5.500</td>
<td>$5.500</td>
</tr>
<tr>
<td><strong>Overhead and Administration cost in $ millions</strong></td>
<td>$2.750</td>
<td>$2.750</td>
<td>$2.750</td>
<td>$2.750</td>
<td>$2.750</td>
</tr>
</tbody>
</table>

Table 1: Cost for manual testing for 5 years
(Source: Industrial sponsor)

The above table shows that the cost for manual testing remains the same over a five-year period considering zero changes in the values on cost. Now we will examine how much the automation can save for the same company. The increase in productivity after automation allows the company to reduce the numbers of test engineers (to 15, 10 in Year-1, and Year-2 respectively) until it reaches an optimal number of five test engineers. This is based on the approach that more and more tests are automated which enables in 5 years an optimal number of 5 test engineers can handle the work which was previously done by 50 engineers.
<table>
<thead>
<tr>
<th>Year</th>
<th>Year-1</th>
<th>Year-2</th>
<th>Year-3</th>
<th>Year-4</th>
<th>Year-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of test engineers</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Annual Salary in $ millions</td>
<td>$1.650</td>
<td>$1.100</td>
<td>$0.550</td>
<td>$0.550</td>
<td>$0.550</td>
</tr>
<tr>
<td>Overhead and Administration cost in $ millions</td>
<td>$0.825</td>
<td>$0.550</td>
<td>$0.275</td>
<td>$0.275</td>
<td>$0.275</td>
</tr>
<tr>
<td>Automation Testing cost in $ millions</td>
<td>$2.475</td>
<td>$1.650</td>
<td>$0.825</td>
<td>$0.825</td>
<td>$0.825</td>
</tr>
<tr>
<td>Cost savings due to automation or benefit in $ millions</td>
<td>$5.775</td>
<td>$6.600</td>
<td>$7.425</td>
<td>$7.425</td>
<td>$7.425</td>
</tr>
<tr>
<td>Net cost savings = Cost savings due to automation - cost to automate, in $ millions</td>
<td>$3.946</td>
<td>$4.771</td>
<td>$5.596</td>
<td>$5.596</td>
<td>$5.596</td>
</tr>
</tbody>
</table>

Table 2: Automation testing- Cost and benefit analysis
(Source: Industrial sponsor)

The above table shows that adapting to automation testing reduces the cost year after year and the net cost savings increasing from $3.946M to $5.596M in 5 years. The cost savings due to automation is a result of subtracting the total automation testing cost from total manual testing cost. For example during the Year-1, $8.25M - $2.475M = $5.775M. Later sections show that the investment required for developing test automation is $1.829M. The net cost savings is calculated based on the formula “Net Cost Savings = Cost Savings due to automation - Investment required for developing test automation”. From this formula for the first year, Net cost savings = $5.775M - $1.829M = $3.946M. The net cost savings increased year by year due to automation. This resulted in the reduction of number of test engineers every year as shown in the table above. Therefore, by adapting to automation testing, the net cost savings reached $5.596M in the
fifth year of operation for a typical test group of 50 manual test engineers as shown in the example. The Figure-4 below shows the costs associated with manual and automation methods of testing. The manual testing cost remains the same at $8.25M, whereas the automation testing cost significantly reduced during the first two years and reaches to an optimal cost just to sustain the testing.

![Automation Vs Manual Testing costs](image)

**Figure 4: Manual testing cost compared against automation testing cost**

The table below shows aggregate costs over five year period associated with automation and manual testing.
<table>
<thead>
<tr>
<th>Overall Cost for 5 years, in $ millions</th>
<th>Manual</th>
<th>Automation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$41.25</td>
<td>$6.60</td>
</tr>
<tr>
<td>Cost savings over 5 year period, in $ millions</td>
<td>Nil</td>
<td>$34.65</td>
</tr>
</tbody>
</table>

Table 3: Aggregate costs associated with automation and manual testing

The percentage cost savings for a five year period due to automation can be calculated using the formula:

\[
\text{Percentage cost savings due to automation} = \frac{\text{Overall Cost savings due to automation}}{\text{Overall cost for manual test}}} \times 100
\]

\[
= \frac{($34.65/$41.25)}{100} = 84\%
\]

The above calculation shows that significant cost savings as high as 84% can be achieved in a five year period by adapting to test automation methods.

7 Automation Testing Implementation

In order to implement the automation testing on Tellabs 8800 series router a number of script and library files are created. The automation development can fall in to three major modules. Appendix-A shows the software codes developed for automation testing on Tellabs 8800 series router along with the log files as a result of running test automation. The automation software code and logs given in the Appendix-A are categorized as Module-1, Module-2 and Module-3. A brief description of these modules is as shown below:

**Module-1**: Comprises of TCL scripts for the libraries. The table below shows the script library files developed as part of the test automation implementation.
<table>
<thead>
<tr>
<th>Script Library name</th>
<th>Type</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>proc connect8800</td>
<td>TCL procedure</td>
<td>Connects to the Tellabs 8800 router and returns a session ID which can be used for further communication with the system</td>
</tr>
<tr>
<td>proc issueCommand</td>
<td>TCL procedure</td>
<td>Uses the session ID provided by the connect8800 procedure and sends commands to the system. Used for command line interface (CLI) communication</td>
</tr>
<tr>
<td>proc issueCommand1</td>
<td>TCL procedure</td>
<td>This is a variation of the “issueCommand” procedure with additional arguments to get more control in the session</td>
</tr>
<tr>
<td>proc issueCommandwithTout</td>
<td>TCL procedure</td>
<td>This is a variation of the “issueCommand” procedure where a timeout can be provided as an argument and system will timeout if a response is not received within a specified time period, for example 30 seconds</td>
</tr>
<tr>
<td>proc parseArgs</td>
<td>TCL procedure</td>
<td>Provides parsing facility for the response obtained from the router and can be used to compare the expected and actual results. Parsing will make a decision to PASS or FAIL a test case</td>
</tr>
<tr>
<td>proc enableAdminMultiVTs</td>
<td>TCL procedure</td>
<td>The Virtual Tributaries (VTs) contain the data carried by the system. This procedure allows to enable the administration state of the VTs</td>
</tr>
<tr>
<td>proc enableAdminMultiDS1s</td>
<td>TCL procedure</td>
<td>The DS1s are considered as payload information for the Virtual tributaries. This procedure allows to enable the administration state of the DS1s</td>
</tr>
</tbody>
</table>

Table 4: Test Automation script library files
**Module-2:** Comprises of TCL scripts to run automation using the Module-1 scripts. The most important script that we created and tested is to create a scalable system by creating 2000 interfaces on Tellabs router. We used the script “Create2000_IPint.exp” for this purpose. The Appendix A provides the details and the code developed.

**Module-3:** Comprises of output log files generated and stored by running Module-2 test automation software on Tellabs 8800 series router. The Appendix A provides the details of the code captured.

### 7.1 Test Automation - measured results

The calculations below show the improvements that occurred after implementing the scripts for automation. The approach followed here was to record the timings and parameters generated for 2000 IP interfaces on Tellabs 8800 series router using both automated and manual methods. The recorded results are compared to calculate the improvements achieved by automation. The comparison table at the end of this section tabulates the results.

**Calculations for time savings: Manual testing**

Number of commands required for creating one IP interface on Tellabs 8800 router = 8  
Time taken for manually sending 8 commands to Tellabs 8800 router = 5 minutes  
Time taken to create one IP interface on Tellabs 8800 router = 5 minutes  
Time taken to create 2000 IP interfaces on Tellabs 8800 router = 2000*5 = 10000 minutes or about 21 days (considering 8 hours of manual testing /day).
**Calculations for time savings: Automation testing**

Number of commands required for creating one IP interface on Tellabs 8800 router = 8

Time taken for sending/responding 8 commands to Tellabs 8800 router = 40 seconds

Inter command gap period given in automation script = 2 seconds

Total inter-command gap period between 8 commands = 16 seconds

Total time to send/respond with inter-command gaps for 8 commands = 56 seconds

Time taken to creation one IP interface on Tellabs 8800 router = 56 seconds

Time taken to create 2000 IP interfaces on Tellabs 8800 router = 2000*56/60 = 1866.7 minutes or 31.11 hours or about 3.89 days (considering 8 hours of testing /day).

**Calculations for accuracy measurement: Manual testing**

Number of IP interfaces attempted to create manually = 2000

Actual number of IP interfaces retrieved from system at the end of 21 days = 1968

Number of missing interfaces = 2000 -1968 = 32

Percentage error = (32/2000)*100 = 1.6 %

Accuracy = 100% -1.6% = 98.4%

**Calculations for accuracy measurement: Automation testing**

Number of IP interfaces attempted to create using test automation = 2000

Actual number of IP interfaces retrieved from system at the end of automation = 2000

Number of missing interfaces = 0

Percentage error = (0/2000)*100 = 0 %

Accuracy = 100% -0% = 100%
**Calculations for Cost savings: Manual testing**

Labor rate for manual test engineer = $75/hour

Adjusted labor rate = $75+$37.5 = $112.5 (added 50% for benefits and other)

Number of working hours per day = 8 hours

Total labor charges for 21 days of manual testing = $112.5*8*21 = $18,900

Administration and overhead costs for an engineer for a day = $500

Administration and overhead costs for an engineer for 21 days = 21* $500=$10,500

**Total cost for manual testing =$29,400**

**Calculations for Cost savings: Automation testing**

Labor rate for automation test engineer = $80/hour

Adjusted labor rate = $80+$40 = $120 (added 50% for benefits and other)

Number of working hours per day = 8 hours

Total labor charges for 3.89 days of manual testing = $120*8*3.89 = $3734.4

Administration and overhead costs for an engineer for a day = $500

Administration and overhead costs for an engineer for 3.89 days = 3.89* $500=$1945

**Total cost for automation testing =$3734.4+$1945 = $5679.4**

**Productivity calculations**

As given in the “Center for Information-Development Management” newsletter, “To measure productivity, you simply count the number of widgets produced and divide by the amount of time or cost it took to produce them.” (Infomanagementcenter, 2004). In the case of manual or automation testing for creating 2000 numbers of IP interfaces on Tellabs 8800 router, each interface can be considered as a widget.
Calculations for Productivity: Manual testing

Time taken for manual testing of 2000 IP interfaces = 21 days

Productivity factor for manual testing calculated based on time = 2000/21 = \textbf{95.238}

Productivity factor for manual testing calculated based on cost = 2000/29400 = \textbf{0.06802}

Calculations for Productivity: Automation testing

Time taken for automation testing of 2000 IP interfaces = 3.89 days

Productivity factor for automation calculated based on time = 2000/3.89 = \textbf{514.138}

Productivity factor for automation calculated based on cost = 2000/5679.4 = \textbf{0.3521}

The benefits of our test automation measured from actual tests run on Tellabs 8800 meet or exceed our hypotheses. The following table shows overall test results.

<table>
<thead>
<tr>
<th>Time</th>
<th>Manual Testing</th>
<th>Automation Testing</th>
<th>Benefits due to automation</th>
<th>Benefit due to automation in percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 days</td>
<td>3.89 days</td>
<td>17.11 days savings</td>
<td>81.47% savings over manual testing</td>
</tr>
<tr>
<td>Accuracy</td>
<td>98.4%</td>
<td>100%</td>
<td>100% accuracy</td>
<td>100% accurate results</td>
</tr>
<tr>
<td>Cost</td>
<td>$29,400</td>
<td>$5679.4</td>
<td>$23720.6 savings</td>
<td>80.68% less than manual testing</td>
</tr>
<tr>
<td>Productivity based on time factor</td>
<td>95.238</td>
<td>514.138</td>
<td>418.9 factor increase</td>
<td>439.85% increase in productivity</td>
</tr>
<tr>
<td>Productivity based on cost factor</td>
<td>0.06802</td>
<td>0.3521</td>
<td>0.28408 factor increase</td>
<td>417.64% increase in productivity</td>
</tr>
</tbody>
</table>

Table 5: Automation test results compared with Manual test results
<table>
<thead>
<tr>
<th></th>
<th>Targets to achieve</th>
<th>Actual measured result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time savings</td>
<td>80% or better</td>
<td>81.47%</td>
</tr>
<tr>
<td>Accuracy</td>
<td>95% or better</td>
<td>100%</td>
</tr>
<tr>
<td>Cost</td>
<td>40% or better</td>
<td>80.68%</td>
</tr>
<tr>
<td>Productivity based on time factor</td>
<td>350% or better</td>
<td>439.85%</td>
</tr>
<tr>
<td>Productivity based on cost factor</td>
<td>350% or better</td>
<td>417.64%</td>
</tr>
</tbody>
</table>

Table 6: Actual measured benefits for automation vs. targets to achieve

In the above table, the values for “Targets to achieve” are coming from the baseline requirements described in section 4.1. The actual measured results prove that the test automation product developed exceeds the design specification requirements.

8 Economic Justification

8.1 Executive Summary

The market for test automation software is experiencing a rapid growth and is forecasted to grow from few million to $1.5 billion within the next few years. Telecom equipment vendors are currently spending huge amounts of money on traditional manual testing methods. Most equipment vendors develop their own customized solutions for testing their equipments. However, they are facing many challenges since their approach is not a total testing solution. A generalized testing solution provides versatility and can meet the current market demands. Due to our unique design, our approach can meet what
the telecom equipment vendors are looking for and bring us huge revenue opportunity. Our generalized design facilitates connecting to varieties of data traffic generators and physical layer test instruments in a multidimensional test environment. Our test automation software will help reduce testing costs, improve productivity and accuracy of testing. Further, our test architecture shall provide robustness and stability with a simplified testing approach.

The investment capital cost required for prototype development is $1.829 million and it is split as $1.484 million in personnel costs, $250,000 in fixed costs, and $100,000 in overhead costs. Further to reach up to the breakeven period another $1.584 million is needed which is required for salary and overhead expenses. Initial investment of $3.451 million will result in total benefit of $21.32 million by the end of 2014 resulting in 550% ROI in 5 years of operation after development.

We plan to raise $1.829 M as the initial part of the funding in 2009 and make our prototype model. The potential customers are major telecom equipment vendors such as Cisco, Qualcomm, Juniper, Nokia, Motorola, Alcatel Lucent, Ericsson, Samsung, Ciena, Tellabs etc. Our revenue model is based on License fee and we expect to breakeven by year 2010. The revenue is expected to grow from $2.29 million in 2010 to $24.61 million in 2014.
8.2 Problem statement

Software testing costs more than 50% of the entire software development cost. Software testing also takes considerable time of the software development cycle. Some elements of software development are difficult to test using manual testing, for example load testing of 1000 simultaneous users. Therefore, more companies in telecom industry develop in-house software testing automation framework to increase testing efficiency and reliability. There is a need to develop a standard commercially available automation test framework that can be plugged into different systems with minor modifications. This will help companies save time and money spent in developing the in-house automation products. This system will increase the time savings by 80% or more and achieve cost saving of 40% or more over a period.

8.3 Solution and Value Proposition

A generalized automation framework will reduce the efforts in manual testing and provides a versatile testing solution. The test automation framework will significantly reduce cost of testing network elements such as Tellabs 8800 series router. As shown in our measured test results in section 7.1, the time for testing reduced from 21 days to about 4 days using test automation. Results of testing using automation framework will be more reliable and accurate as compared to manual testing. Our framework will significantly improve the efficiency and productivity as shown in section 7.1 and will allow to considerably reduce the number of test engineers.
8.4 Market Size

Test Automation experts from our industrial sponsor Tellabs believe that the market for test automation software will be growing significantly in the next few years. Tellabs continually explores with the software vendors and considers that automation testing software vendors have already emerged in the market and it is showing a high growth potential. Current leading players in the automated testing tool market include Wind River, Borland, and HP-Mercury Interactive. (Mercury interactive, 2009 and Wind River, 2008). In addition to this, most of the telecom equipment vendors develop test automation software for custom solutions. These companies may eventually move to generalized test automation software. According to Wind River one of the major players of automation software tool, "Wind River is addressing this market challenge by automating the software quality assurance process which can contribute to quicker time-to-market and higher product quality. VDC's 2008 survey of embedded developers shows that developers using test automation tools report a greater percent of their projects completed on or ahead of schedule than those who are not using a formal test automation tool.” (Wind River, 2008).

Further, a recent acquisition of Segue software by Borland solutions a global leader in technology sector is an indication of an emerging market in this field. As stated in a Borland article “Borland’s Solution-Oriented Approach to Improving Software Delivery Processes, the market for Software development for automation and life cycle management is forecasted to grow to a few billion dollar business in 2009.” (Borland Software Corporation, 2008). According to a press release from Borland, “Borland’s
ALM solutions play a critical role in helping enterprises manage the complexity of software development and delivery, by providing business, development, and operational teams with increased visibility and control over all phases of the software lifecycle. This is especially crucial for large enterprises working within heterogeneous and distributed environments. IDC forecasts the ALM market to grow to $3.3 billion in 2009.” (Borland Software Corporation, 2008).

In addition to Borland and HP, other top 11 companies engaged in test automation software are listed in the table below. These companies employ hundreds of test engineers to test their core business unit software. They spent millions of dollars every year to test their software solutions. The table below shows the list of these companies along with the details on the number of test engineers and approximate spending (market size).

<table>
<thead>
<tr>
<th>Number</th>
<th>Top 10 potential customers</th>
<th>Approximate number of engineers engaged in core business unit for developing automation/testing</th>
<th>Test Automation Market size in Million dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cisco</td>
<td>1500</td>
<td>$300</td>
</tr>
<tr>
<td>2</td>
<td>Juniper</td>
<td>700</td>
<td>$140</td>
</tr>
<tr>
<td>3</td>
<td>Nokia</td>
<td>1000</td>
<td>$200</td>
</tr>
<tr>
<td>4</td>
<td>Alcatel Lucent</td>
<td>700</td>
<td>$140</td>
</tr>
<tr>
<td>5</td>
<td>Motorola</td>
<td>1000</td>
<td>$200</td>
</tr>
<tr>
<td>6</td>
<td>Qualcomm</td>
<td>1500</td>
<td>$300</td>
</tr>
<tr>
<td>7</td>
<td>Ericsson</td>
<td>700</td>
<td>$140</td>
</tr>
<tr>
<td>8</td>
<td>Samsung</td>
<td>400</td>
<td>$80</td>
</tr>
<tr>
<td>10</td>
<td>Ciena</td>
<td>100</td>
<td>$20</td>
</tr>
<tr>
<td>11</td>
<td>Tellabs</td>
<td>30</td>
<td>$6</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>7630</td>
<td>$1,526</td>
</tr>
</tbody>
</table>

Table 7: Top 11 companies engaged in custom test automation software
(Source: Survey conducted over networking professionals and Salary Wizard, 2008)
8.4.1 Revenue Growth

According to Industry center-Application software, Yahoo Finance, the application software has a total market capitalization of $459 billion, as of October 6, 2008. With very few companies in the market, the ALM market share is currently less than $100 million. The application software is in the mature market and typically the growth is 10% or less, whereas the ALM software is in the growth market where the growth potential is much high. The table below lists the market share estimates until year 2011 for both lines of software assuming a 10% growth in application software and a 63% growth in the ALM software.

<table>
<thead>
<tr>
<th>Category</th>
<th>Year 2008</th>
<th>Estimate for Year 2009</th>
<th>Estimate for Year 2010</th>
<th>Estimate for Year 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Application Software Market</td>
<td>$459 billion</td>
<td>$504 billion</td>
<td>$555 billion</td>
<td>$610 billion</td>
</tr>
<tr>
<td>ALM market share</td>
<td>$100 million</td>
<td>$3.3 billion</td>
<td>$5.379 billion</td>
<td>$8.767 billion</td>
</tr>
<tr>
<td>Percentage of ALM as a fraction of Application Software</td>
<td>0.02%</td>
<td>0.65%</td>
<td>0.97%</td>
<td>1.38%</td>
</tr>
<tr>
<td>% projected growth</td>
<td>--</td>
<td>63%</td>
<td>63%</td>
<td>--</td>
</tr>
</tbody>
</table>

Table 8: Forecasts for ALM software market share for 2009-2011
(Source: Industry center-Application software, Yahoo Finance)
The forecasts for the ALM market share for years 2009 to 2011 as a proportion of the total application software market is shown in the figure below.

![Market share for Application software and ALM software](image)

**Figure 5: Market share for Application software and ALM software**

In line with the projected revenue growth of the ALM software market, our automation testing software development is also estimated to yield substantial revenue growth. During the initial phase of the product development, revenues from our potential customers are as given in the table below. From our survey report, Table -7 shows Cisco employing about 1500 test engineers in their core business unit. If 2% of these test engineers adapt to our test automation it gives an opportunity to sell 30 licenses. The estimates in the table below are kept at conservative figures. However but based on the
market demand and acceptance of our technology our actual revenue growth may be much more.

<table>
<thead>
<tr>
<th></th>
<th>Top 10 potential customers</th>
<th># of Test Engineers</th>
<th>% of licenses projected from 2009 to 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>0% in 2009</td>
</tr>
<tr>
<td>1</td>
<td>Cisco</td>
<td>1500</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Juniper</td>
<td>700</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Nokia</td>
<td>1000</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Alcatel Lucent</td>
<td>700</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>Motorola</td>
<td>1000</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>Qualcomm</td>
<td>1500</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>Ericsson</td>
<td>700</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>Samsung</td>
<td>400</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>Ciena</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>Tellabs</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Projected sales for Total # of Licenses</td>
<td>0</td>
<td>153</td>
</tr>
<tr>
<td></td>
<td>Revenue in $ million</td>
<td>0</td>
<td>$2.29</td>
</tr>
</tbody>
</table>

Table 9: Projected sales for Software licenses and associated revenues

The chart below shows the revenue growth that is projected from the potential customers
Figure 6: Revenue growth

8.5 Competitors

Due to the unprecedented opportunity as of now, we do not have any direct competitors. However, companies like IBM, Wind River, Borland, Cisco, Juniper BMC Software, Microsoft, Mercury, and Aptest can be our potential competitors. These companies have been key players in the software testing tools market. Currently there is no generalized automation framework available for telecom networking industry but these companies might be working on similar products. Although companies like Cisco and Juniper develop test automation to meet their in-house demands, they can make
changes and commercialize it. However, the drawback of such a product will be it will lack versatility and cannot provide total testing solutions that our product provides.

### 8.6 Customers

There is a huge market potential for the automation test software in the telecom industry. Table 10 below shows a list of potential customers who can benefit from our test automation development. Most of our customer will be from telecom industry for example Cisco Systems, Juniper and many more. The ordering of our customers is decided based on the priority of our targeting. For example, we consider Cisco the leading networking giant to be our top most customer. Juniper is second in our list because Juniper is considered a second highest leader in the networking industry followed by Cisco. The order of other companies Nokia, Alcatel Lucent, Motorola etc. are chosen since those companies will be targeted to follow the success stories from Cisco and Juniper. Our customers will get a framework, compatible to their system as well as ready to use. This will reduce the test cycle time and improve the test efficiency. In these organizations, the software automation testing engineers will be our key customers. We need to convince the middle level manager of the team to use our products and buy it. However, the actual users of our product will be software quality engineers. Apart from network product companies, companies like AT&T, Verizon, Samsung, Nokia, Sprint, T-Mobiles, Vonage, and Comcast can be other potential customers. For example, Comcast tests the scalability of routers, if they buy our product it can help in testing a scalability requirement such as support for 100,000 customers.
<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Top 11 potential customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cisco</td>
</tr>
<tr>
<td>2</td>
<td>Juniper</td>
</tr>
<tr>
<td>3</td>
<td>Nokia</td>
</tr>
<tr>
<td>4</td>
<td>Alcatel Lucent</td>
</tr>
<tr>
<td>5</td>
<td>Motorola</td>
</tr>
<tr>
<td>6</td>
<td>Qualcomm</td>
</tr>
<tr>
<td>7</td>
<td>Ericsson</td>
</tr>
<tr>
<td>8</td>
<td>Samsung</td>
</tr>
<tr>
<td>9</td>
<td>Nortel</td>
</tr>
<tr>
<td>10</td>
<td>Ciena</td>
</tr>
<tr>
<td>11</td>
<td>Tellabs</td>
</tr>
</tbody>
</table>

Table 10: Potential customers
(Source: Survey conducted over networking professionals)

8.7 Cost

The table below gives the initial prototype cost to develop an automation testing harness tool. Total cost to develop the prototype would include fixed costs, variable costs, and personnel costs. The following table has the costs associated to personnel.
<table>
<thead>
<tr>
<th>Personnel</th>
<th>Annual Salary in US $</th>
<th>Loaded cost, 40% extra</th>
<th>Salary cost for 9 months (duration to develop automation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO/CFO</td>
<td>200,000</td>
<td>280,000</td>
<td>210,000</td>
</tr>
<tr>
<td>VP/Director Engineering HR Manager</td>
<td>150,000</td>
<td>210,000</td>
<td>157,500</td>
</tr>
<tr>
<td>Administrative assistant</td>
<td>58,000</td>
<td>81,200</td>
<td>60,900</td>
</tr>
<tr>
<td>QA/Automation Engineering Manager</td>
<td>120,000</td>
<td>168,000</td>
<td>126,000</td>
</tr>
<tr>
<td>Automation tool development engineer</td>
<td>100,000</td>
<td>140,000</td>
<td>105,000</td>
</tr>
<tr>
<td>Automation Scripts development Engineer-1</td>
<td>80,000</td>
<td>112,000</td>
<td>84,000</td>
</tr>
<tr>
<td>Automation Scripts development Engineer-2</td>
<td>80,000</td>
<td>112,000</td>
<td>84,000</td>
</tr>
<tr>
<td>QA test engineer-1</td>
<td>90,000</td>
<td>126,000</td>
<td>94,500</td>
</tr>
<tr>
<td>Automation Support engineer</td>
<td>70,000</td>
<td>98,000</td>
<td>73,500</td>
</tr>
<tr>
<td>Sales and Marketing Manager</td>
<td>115,000</td>
<td>161,000</td>
<td>120,750</td>
</tr>
<tr>
<td>Customer Support Engineer-1</td>
<td>80,000</td>
<td>112,000</td>
<td>84,000</td>
</tr>
<tr>
<td>Customer Support Engineer-2</td>
<td>70,333</td>
<td>98466.2</td>
<td>73,850</td>
</tr>
<tr>
<td>IT/GIS support engineer</td>
<td>80,000</td>
<td>112000</td>
<td>84,000</td>
</tr>
<tr>
<td><strong>Total Salary Cost</strong></td>
<td><strong>1,413,333</strong></td>
<td><strong>1,978,666</strong></td>
<td><strong>1,484,000</strong></td>
</tr>
</tbody>
</table>

Table 11: Personnel costs for developing Automation  
(Sources: Survey conducted over networking professionals and Salary Wizard, 2008)
The following table has the fixed costs. Assumptions are as follows.

- Need Unix workstations costing $10,000
- Need Dell Desk top Computers costing $10,000
- Corporate software licenses required for a year costing $25,000

<table>
<thead>
<tr>
<th>Fixed Costs</th>
<th>Total Cost (In Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIX workstations</td>
<td>10,000</td>
</tr>
<tr>
<td>Dell Computers/laptops</td>
<td>10,000</td>
</tr>
<tr>
<td>Routers/Switches (Test bed)</td>
<td>200,000</td>
</tr>
<tr>
<td>Software</td>
<td>25,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>245,000</strong></td>
</tr>
</tbody>
</table>

Table 12: Fixed costs for developing automation
(Source: Industrial sponsor)

The following table has the variable costs.

<table>
<thead>
<tr>
<th>Variable Costs</th>
<th>Total Cost (In Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office Space and Maintenance</td>
<td>60,000</td>
</tr>
<tr>
<td>Office Supplies</td>
<td>10,000</td>
</tr>
<tr>
<td>Other overhead- recruiting, accounting, accounting, billing, payroll, licenses, taxes</td>
<td>30,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100,000</strong></td>
</tr>
</tbody>
</table>

Table 13: Variable Costs for developing automation
(Source: Industrial sponsor)

Total prototype development cost = $1,484,000 + $245,000 + $100,000 = $1,829,000
The calculations above show that approximate cost for developing automation prototype is $1.829 million. VC funding will meet the initial capital requirement.

The figure below shows how the initial funding of $1.829 million will be utilized. Major part of the initial budget will be for salary expenses since developing software code will require more engineers.

![Distribution of initial budget](image)

**Figure 7: Distribution of initial budget**

### 8.8 Price Point

Our license fee structure will be highly competitive compared to our competitors. Our market study shows that our competitors charges up to $15,000 per annum for test automation software, where as our fee will be only $13,000 per annum. In addition our competitors charges up to $4500 for support and $4500 for training. Our charges for
support and training will be a nominal $1000 each for the first three years and increase up to $4500 from fourth year onwards. These license pricing will be based on renewals annually. The table below details our license structure.

<table>
<thead>
<tr>
<th>Item</th>
<th>Competition</th>
<th>Ours</th>
</tr>
</thead>
<tbody>
<tr>
<td>License fee</td>
<td>$15,000 / Annum</td>
<td>$13,000/ Annum</td>
</tr>
<tr>
<td>Support</td>
<td>$4500 / Annum</td>
<td>$1000 for first 3 years and increases to $4500 afterwards</td>
</tr>
<tr>
<td>Training</td>
<td>$4500 / Annum</td>
<td>$1000 for first 3 years and increases to $4500 afterwards</td>
</tr>
</tbody>
</table>

*Table 14: Test Automation License/Support/Training fee structure*

The figure below compares our license fee structure with our competition.

*Figure 8: License fee structure comparison with our competition*
8.9 SWOT Assessment

![SWOT Analysis Diagram]

Figure 9: SWOT Analysis
(SWOT analysis, 2008)

Strengths

- Low cost provider: We are low cost solution provider for test automation framework.
- Technology: Our generalized testing architecture provides total testing solutions
- Customizations: Our test automation tool is generic enough to accommodate needs for testing other vendor's network equipments.
- Accuracy: Our test automation tool will give more accurate results than traditional methods for testing network equipment.

Weaknesses

- We are relatively small player in this emerging market.
• We do not have enough resources such as routers and switch gears of many companies. Having equipments of multiple vendors would have helped us in accelerating development and testing of our test automation software.

Opportunities

• Sell to other network equipment manufacturers such as Cisco, Juniper, Nortel network etc.

• Because of deep expertise in networking, our company may provide consulting services to other networking companies.

• We shall be able to emerge as a global player since no such solution exists currently in the global market.

Threats

• Test automation software for network equipment is relatively new industry.

• Entry of new players in the market and other network equipment manufacturers are potential threats to the business.

• Non acceptance of our solution by any of our first customers is a great threat

• Due to the generalized nature our product competitors may come up to speed on our idea and may pose potential threat for us.

• Due to the background of customers they may start developing individual solutions based our idea unless our intellectual property is fully protected in all respects.
8.10 Investment Capital requirements

In addition to the prototype development cost, there are additional expenses to run the company until the breakeven period. The breakeven period is 9 months after the prototype development. This demands an additional funding as shown in the table below.

<table>
<thead>
<tr>
<th>Salary expenses for 9 months</th>
<th>$1,484,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overhead expenses for 9 months</td>
<td>$100,000</td>
</tr>
<tr>
<td><strong>Total to run the company between prototype development and Breakeven</strong></td>
<td><strong>$1,584,000</strong></td>
</tr>
</tbody>
</table>

Table 15: Additional funding

Total funding required for reaching the breakeven period

\[
= 1.829 \text{M} + 1.584 \text{M} = 3.413 \text{M}
\]

8.11 Personnel

In order to develop automation on similar products such as Tellabs router, we will need following personnel as shown in the table below.
<table>
<thead>
<tr>
<th>Number</th>
<th>Personnel for Automation test development</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CEO/CFO</td>
</tr>
<tr>
<td>2</td>
<td>VP/Director Engineering</td>
</tr>
<tr>
<td>3</td>
<td>HR Manager</td>
</tr>
<tr>
<td>4</td>
<td>Administrative assistant</td>
</tr>
<tr>
<td>5</td>
<td>QA/Automation Engineering Manager</td>
</tr>
<tr>
<td>6</td>
<td>Automation tool development engineer</td>
</tr>
<tr>
<td>7</td>
<td>Automation Scripts development Engineer-1</td>
</tr>
<tr>
<td>8</td>
<td>Automation Scripts development Engineer-2</td>
</tr>
<tr>
<td>9</td>
<td>QA test engineer-1</td>
</tr>
<tr>
<td>10</td>
<td>Automation Support engineer</td>
</tr>
<tr>
<td>11</td>
<td>Sales and Marketing Manager</td>
</tr>
<tr>
<td>12</td>
<td>Customer Support Engineer-1</td>
</tr>
<tr>
<td>13</td>
<td>Customer Support Engineer-2</td>
</tr>
<tr>
<td>14</td>
<td>IT/GIS support engineer</td>
</tr>
</tbody>
</table>

Table 16: Personnel  
(Source: Survey conducted over networking professionals)

8.12 Business Revenue Model

The development of test automation framework is an expensive investment for most networking companies. The changes in technology and migration to new protocols will add up the expenses. Therefore, for our company we will use subscription-based
model and further revenue will come by selling supporting features for the customers. We will develop additional features to provide customized version of the automation framework as per our customer requirements. This subscription license fee including training and support will cost $15,000 annually per license. Customers will have opportunities to install new features and additional functionality at an additional cost of $1000 per annum per functionality. For example, the GUI interface will cost them $1000 per annum. If we sell 10 subscriptions in the first year, it will generate $150,000. From time to time, we will add new features to cater to the needs of changing technologies.

8.12.1 Return on Investment

8.12.1.1 Breakeven Analysis

The Figure-9 below shows the breakeven analysis. The calculation is based on eleven of our potential customers make 2% of their test engineers adapt to our automation solutions. As a result, we shall be selling 153 licenses during the year 2010 and sales expected to increase significantly year after year. The following table displays the distribution of sales for the number of licenses, associated revenue, cost, and profit from Quarter-1 to Quarter-4 during Year-2010.

<table>
<thead>
<tr>
<th>Quarter</th>
<th># of licenses</th>
<th>Revenue</th>
<th>Cost</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010-Q1</td>
<td>25</td>
<td>$0.375</td>
<td>$0.396</td>
<td>-$0.021</td>
</tr>
<tr>
<td>2010-Q2</td>
<td>35</td>
<td>$0.525</td>
<td>$0.396</td>
<td>$0.129</td>
</tr>
<tr>
<td>2010-Q3</td>
<td>40</td>
<td>$0.6</td>
<td>$0.396</td>
<td>$0.204</td>
</tr>
<tr>
<td>2010-Q4</td>
<td>53</td>
<td>$0.795</td>
<td>$0.396</td>
<td>$0.399</td>
</tr>
<tr>
<td>Total</td>
<td>153</td>
<td>$2.295</td>
<td>$1.584</td>
<td>$0.711</td>
</tr>
</tbody>
</table>

Table 17: Distribution of Q1 to Q4 sales for year 2010
The profit will grow during the subsequent years after the breakeven. The chart below shows the expected profits up to the year 2014.
Figure 11: Breakeven analysis for Year-2009 to Year-2014

8.12.1.2 ROI

A company that develops and sells test automation software can expect huge return on investment. This is because a test automation business is a new idea and not many companies are doing business in this line. Further providing total testing solutions can attract many who are looking for comprehensive testing solution. The tables below show the potential sales and our ROI calculations for years 2009 to 2014.
<table>
<thead>
<tr>
<th>Rank</th>
<th>Top 10 potential customers</th>
<th># of Test Engineers</th>
<th>% of licenses projected from 2009 to 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>0% in 2009</td>
</tr>
<tr>
<td>1</td>
<td>Cisco</td>
<td>1500</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Juniper</td>
<td>700</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Nokia</td>
<td>1000</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Alcatel Lucent</td>
<td>700</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>Motorola</td>
<td>1000</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>Qualcomm</td>
<td>1500</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>Ericsson</td>
<td>700</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>Samsung</td>
<td>400</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>Ciena</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>Tellabs</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>7630</strong></td>
<td><strong>0</strong></td>
</tr>
</tbody>
</table>

### Number of engineers to be employed in our company during years 2009 to 2014

- 2009: 14
- 2010: 14
- 2011: 14
- 2012: 16
- 2013: 18
- 2014: 20

**Table 18: Potential sales for years 2009 to 2014**

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projected # of licenses</td>
<td>0</td>
<td>153</td>
<td>382</td>
<td>763</td>
<td>1145</td>
<td>1526</td>
</tr>
<tr>
<td>Revenue</td>
<td>$0.00</td>
<td>$2.29</td>
<td>$5.72</td>
<td>$11.45</td>
<td>$17.85</td>
<td>$24.61</td>
</tr>
<tr>
<td>Cost</td>
<td>$1.83</td>
<td>$1.58</td>
<td>$1.90</td>
<td>$2.28</td>
<td>$2.74</td>
<td>$3.28</td>
</tr>
<tr>
<td>Profit (Benefit)</td>
<td>-$1.83</td>
<td>$0.71</td>
<td>$3.82</td>
<td>$9.16</td>
<td>$15.12</td>
<td>$21.32</td>
</tr>
<tr>
<td>ROI = (Benefit – cost)/cost</td>
<td>-200.00%</td>
<td>-55.49%</td>
<td>101.06%</td>
<td>301.76%</td>
<td>425.29%</td>
<td>549.16%</td>
</tr>
</tbody>
</table>

**Table 19: ROI calculations for years 2009 to 2014**
The above calculation shows that the cost for sustaining after the second year of operation will increase in proportion to the market share. It is assumed that a maximum of 20% increase in cost in forthcoming years. From year 2010, the cost for hardware/software is eliminated since the same items are reutilized. Only the salary and overhead expenses are accounted and estimated to be $1.58 million. Accordingly the cost is increasing up to $3.28 million in the year 2014, from $1.829 million during the first year. The calculations for ROI show that the development of test automation software has a potential growth of up to 549.16% in a five year period after development.

### 8.13 Strategic Alliance/Partners

There is a potential to form strategic partnership and alliance with existing customers. We can also establish relationship with companies like IBM, Mercury, Borland, and Segue to bundle our networking automation framework with their existing products. For example, we can bundle our framework with Silk test, Aptest, and Rational tools.

### 8.14 Profit and Loss

Our estimates show that during the first year 153 licenses will be sold and the number increases year by year to reach up to 1526 licenses by 2014. The associated profit goes up from $0.71 million during 2010 to $21.32 million by 2014. Figure 10 shows the forecasted profit and loss from year 2009 to 2014.
8.14.1 Norden-Rayleigh graph

The Computations and Rayleigh graph for cumulative funding required with a shape parameter $a = 0.0112$ is shown below. The graph shows with a value for $a=0.0112$, about $1.83$ million initial funding will be utilized during the first 9 months of the project. The first driver that led to use a value of $a= 0.0112$ is that a cash flow only $1.83$ million is available during the initial 9 months development period. The second driver for using $a=0.0112$ is that a total cash of $3.4$ million is available within a period of 18 months prior to the break even period. As estimated, we plan to finish the prototype development to be over during the initial 9 months period, meaning we are right on the schedule. With proven results from the prototype development, the next series of funding for the remaining $1.54$ million will allow us to reach until the breakeven. The value for $a = 0.0112$ seems optimal for us since the curve shows we are neither ahead of the cost profile nor behind the time schedule.
Figure 7: Rayleigh Cumulative Cost Distribution

The table shows the probability density function for the Rayleigh based financial profile for our test automation development project.
Figure 8: Probability density function

8.14.2 Financial Statements

The sections below show projected financial statements.
### 8.14.2.1 Balance Sheet

All numbers in $1000

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>3500</td>
<td>1170</td>
<td>771</td>
<td>2566</td>
<td>6757</td>
<td>14463</td>
</tr>
<tr>
<td>Inventory</td>
<td>0</td>
<td>0</td>
<td>158</td>
<td>190</td>
<td>228</td>
<td>274</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>0</td>
<td>0</td>
<td>275</td>
<td>686</td>
<td>1374</td>
<td>2142</td>
</tr>
<tr>
<td>Total current assets</td>
<td>3500</td>
<td>1170</td>
<td>1204</td>
<td>3442</td>
<td>8359</td>
<td>16879</td>
</tr>
<tr>
<td>Gross property, plant &amp; equipment</td>
<td>400</td>
<td>500</td>
<td>600</td>
<td>700</td>
<td>800</td>
<td>900</td>
</tr>
<tr>
<td>Less accumulated depreciation</td>
<td>0</td>
<td>-100</td>
<td>-200</td>
<td>-300</td>
<td>-400</td>
<td>-500</td>
</tr>
<tr>
<td>Net property, plant &amp; equipment</td>
<td>400</td>
<td>400</td>
<td>400</td>
<td>400</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Total assets</td>
<td>3900</td>
<td>1570</td>
<td>1604</td>
<td>3842</td>
<td>8759</td>
<td>17279</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>0</td>
<td>0</td>
<td>126</td>
<td>152</td>
<td>182</td>
<td>219</td>
</tr>
<tr>
<td>Bank notes payable</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total current liabilities</td>
<td>0</td>
<td>0</td>
<td>126</td>
<td>152</td>
<td>182</td>
<td>219</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>3500</td>
<td>3000</td>
<td>2500</td>
<td>2000</td>
<td>1500</td>
<td>1000</td>
</tr>
<tr>
<td>Shareholders’ equity</td>
<td>0</td>
<td>-1830</td>
<td>-1423</td>
<td>1290</td>
<td>6677</td>
<td>15660</td>
</tr>
<tr>
<td>Total long-term debt and shareholders’ equity</td>
<td>3500</td>
<td>1170</td>
<td>1078</td>
<td>3290</td>
<td>8177</td>
<td>16660</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>3500</td>
<td>1170</td>
<td>1204</td>
<td>3442</td>
<td>8359</td>
<td>16879</td>
</tr>
</tbody>
</table>

Table 20: Balance Sheet Calculation
(Source: www.exinfm.com)
### 8.14.2.2 Profit and Loss Statements

All numbers in $1000

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>0</td>
<td>2,290</td>
<td>5,720</td>
<td>11,450</td>
<td>17,850</td>
<td>24,610</td>
</tr>
<tr>
<td>Less COGS</td>
<td>-1,830</td>
<td>-1,580</td>
<td>-1,900</td>
<td>-2,280</td>
<td>-2,740</td>
<td>-3,280</td>
</tr>
<tr>
<td>Gross profit</td>
<td>-1,830</td>
<td>710</td>
<td>3,820</td>
<td>9,170</td>
<td>15,110</td>
<td>21,330</td>
</tr>
<tr>
<td>Less SG&amp;A expenses</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Less depreciation</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Earnings before interest and taxes</td>
<td>-1,830</td>
<td>710</td>
<td>3,820</td>
<td>9,170</td>
<td>15,110</td>
<td>21,330</td>
</tr>
<tr>
<td>Less interest expense</td>
<td>0</td>
<td>-303</td>
<td>-248</td>
<td>-193</td>
<td>-138</td>
<td>-83</td>
</tr>
<tr>
<td>Pre-tax income</td>
<td>-1,830</td>
<td>408</td>
<td>3,573</td>
<td>8,978</td>
<td>14,973</td>
<td>21,248</td>
</tr>
<tr>
<td>Cumulative pre-tax income (NOL)</td>
<td>-1,830</td>
<td>-1,423</td>
<td>2,150</td>
<td>11,128</td>
<td>26,100</td>
<td>47,348</td>
</tr>
<tr>
<td>Taxes</td>
<td>0</td>
<td>0</td>
<td>860</td>
<td>3,591</td>
<td>5,989</td>
<td>8,499</td>
</tr>
<tr>
<td>Pre-tax income</td>
<td>-1,830</td>
<td>408</td>
<td>3,573</td>
<td>8,978</td>
<td>14,973</td>
<td>21,248</td>
</tr>
<tr>
<td>Less taxes</td>
<td>0</td>
<td>0</td>
<td>-860</td>
<td>-3,591</td>
<td>5,989</td>
<td>-8,499</td>
</tr>
<tr>
<td>Net income</td>
<td>-1,830</td>
<td>408</td>
<td>2,713</td>
<td>5,387</td>
<td>8,984</td>
<td>12,749</td>
</tr>
</tbody>
</table>

Table 21: Profit and Loss Calculation
(Source: www.exinfm.com)
### 8.14.2.3  Cash Flow Statement

All numbers in $1000

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net income</td>
<td>0</td>
<td>-1,830</td>
<td>408</td>
<td>2,713</td>
<td>5,387</td>
<td>8,984</td>
</tr>
<tr>
<td>Plus depreciation</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Less increase in inventory</td>
<td>0</td>
<td>0</td>
<td>-158</td>
<td>-32</td>
<td>-38</td>
<td>-46</td>
</tr>
<tr>
<td>Less increase in accounts receivable</td>
<td>0</td>
<td>0</td>
<td>-275</td>
<td>-412</td>
<td>-688</td>
<td>-768</td>
</tr>
<tr>
<td>Plus increase in accounts payable</td>
<td>0</td>
<td>0</td>
<td>126</td>
<td>26</td>
<td>30</td>
<td>37</td>
</tr>
<tr>
<td>Cash flow from operations</td>
<td>0</td>
<td>-1,730</td>
<td>201</td>
<td>2,395</td>
<td>4,791</td>
<td>8,306</td>
</tr>
<tr>
<td>Less investment</td>
<td>-400</td>
<td>-100</td>
<td>-100</td>
<td>-100</td>
<td>-100</td>
<td>-100</td>
</tr>
<tr>
<td>Cash flow from operations and invests</td>
<td>-400</td>
<td>-1,830</td>
<td>101</td>
<td>2,295</td>
<td>4,691</td>
<td>8,206</td>
</tr>
<tr>
<td>Plus net new equity capital raised</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Less dividends paid</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Plus net new long-term debt</td>
<td>3,500</td>
<td>-500</td>
<td>-500</td>
<td>-500</td>
<td>-500</td>
<td>-500</td>
</tr>
<tr>
<td>Plus net new bank borrowings</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cash flow from ops, invests, and finance</td>
<td>3,100</td>
<td>-2,330</td>
<td>-399</td>
<td>1,795</td>
<td>4,191</td>
<td>7,706</td>
</tr>
<tr>
<td>Beginning cash balance</td>
<td>0</td>
<td>3,100</td>
<td>770</td>
<td>371</td>
<td>2,166</td>
<td>6,357</td>
</tr>
<tr>
<td>Ending cash balance</td>
<td>3,100</td>
<td>770</td>
<td>371</td>
<td>2,166</td>
<td>6,357</td>
<td>14,063</td>
</tr>
</tbody>
</table>

Table 22: Cash Flow Statement
(Source: www.exinfm.com)
8.15 Exit Strategy

The initial investment in our company is $3.413 million and the profit grows up to more than $20 million in five years of operation. If we decide to sell the company in 10 years, we will sell it for $300 million. The target companies that can buy or acquire our company are Borland, HP, IBM, Cisco, Juniper, and Samsung.
8.16 Project Schedule

The sections 8.18.1 to 8.18.3 below show the Gantt chart, critical tasks, and milestone activities for the test automation development.

8.16.1 Gantt chart

<table>
<thead>
<tr>
<th>Task Name</th>
<th>Duration</th>
<th>Start</th>
<th>Finish</th>
<th>Predecessor</th>
<th>Resource Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation testing to improve the Productivity</td>
<td>156 days</td>
<td>Fri 8/29/00</td>
<td>Fri 4/3/09</td>
<td>Sunita, Suresh, Savanna</td>
<td></td>
</tr>
<tr>
<td>Objective</td>
<td>4 days</td>
<td>Fri 8/29/00</td>
<td>Wed 9/3/00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selection of Topic</td>
<td>4 days</td>
<td>Fri 8/29/00</td>
<td>Wed 9/3/00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning</td>
<td>21 days</td>
<td>Fri 8/29/00</td>
<td>Fri 9/26/00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team Formation</td>
<td>11 days</td>
<td>Fri 8/29/00</td>
<td>Fri 9/12/00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Define the scope of the project</td>
<td>10 days</td>
<td>Mon 9/15/00</td>
<td>Fri 9/26/00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Define the Project schedule</td>
<td>9 days</td>
<td>Mon 9/15/00</td>
<td>Thu 9/25/00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submit Project Schedule and Presentations</td>
<td>1 day</td>
<td>Fri 9/26/00</td>
<td>Fri 9/26/00</td>
<td>Sunita, Suresh, Savanna</td>
<td></td>
</tr>
<tr>
<td>Literature Review</td>
<td>10 days</td>
<td>Mon 9/29/00</td>
<td>Fri 10/10/00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research coding language(tech, Perl, Java)</td>
<td>5 days</td>
<td>Mon 9/30/00</td>
<td>Fri 10/9/00</td>
<td>Sunita and Savanna</td>
<td></td>
</tr>
<tr>
<td>Research and study similar system(existing)</td>
<td>5 days</td>
<td>Mon 9/30/00</td>
<td>Fri 10/9/00</td>
<td>Suresh</td>
<td></td>
</tr>
<tr>
<td>Research an automation testing methodology</td>
<td>5 days</td>
<td>Mon 9/30/00</td>
<td>Fri 10/9/00</td>
<td>Sunita and Savanna</td>
<td></td>
</tr>
<tr>
<td>Initial draft of Literature Review report</td>
<td>2 days</td>
<td>Mon 10/6/00</td>
<td>Tue 10/7/00</td>
<td>Sunita, Suresh, Savanna</td>
<td></td>
</tr>
<tr>
<td>Final draft of Literature Review report</td>
<td>2 days</td>
<td>Wed 10/6/00</td>
<td>Thu 10/7/00</td>
<td>Sunita, Suresh, Savanna</td>
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<tr>
<td>Submit Literature Review and presentation</td>
<td>1 day</td>
<td>Fri 10/10/00</td>
<td>Fri 10/11/00</td>
<td>Sunita, Suresh, Savanna</td>
<td></td>
</tr>
<tr>
<td>Economic Analysis</td>
<td>10 days</td>
<td>Mon 10/13/00</td>
<td>Fri 10/24/00</td>
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<td></td>
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<tr>
<td>Cost Analysis of the project</td>
<td>4 days</td>
<td>Mon 10/13/00</td>
<td>Thu 10/15/00</td>
<td>Sunita and Savanna</td>
<td></td>
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<tr>
<td>Review with technical sponsor</td>
<td>2 days</td>
<td>Fri 10/17/00</td>
<td>Mon 10/20/00</td>
<td>Suresh</td>
<td></td>
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<tr>
<td>Make the necessary changes to the project</td>
<td>2 days</td>
<td>Tue 10/21/00</td>
<td>Wed 10/22/00</td>
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<td></td>
</tr>
<tr>
<td>Finalize the Economic Analysis report and presentation</td>
<td>1 day</td>
<td>Thu 10/23/00</td>
<td>Thu 10/23/00</td>
<td>Sunita, Suresh, Savanna</td>
<td></td>
</tr>
<tr>
<td>Submit the presentation and Economic Analysis report</td>
<td>1 day</td>
<td>Fri 10/24/00</td>
<td>Fri 10/24/00</td>
<td>Sunita, Suresh, Savanna</td>
<td></td>
</tr>
<tr>
<td>Design Phase</td>
<td>11 days</td>
<td>Mon 10/27/00</td>
<td>Mon 11/10/00</td>
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<tr>
<td>Finalize the requirement specification</td>
<td>2 days</td>
<td>Mon 10/27/00</td>
<td>Tue 10/28/00</td>
<td>Suresh</td>
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<tr>
<td>Prepare a development plan for automation</td>
<td>2 days</td>
<td>Wed 10/29/00</td>
<td>Thu 10/30/00</td>
<td>Suresh</td>
<td></td>
</tr>
<tr>
<td>Create Test data automation</td>
<td>2 days</td>
<td>Wed 10/29/00</td>
<td>Thu 10/30/00</td>
<td>Suresh</td>
<td></td>
</tr>
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Figure 13: Gantt chart 1
<table>
<thead>
<tr>
<th>Task Name</th>
<th>Duration</th>
<th>Start</th>
<th>Finish</th>
<th>Predecessor</th>
<th>Resource Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Phase</td>
<td>11 days?</td>
<td>Mon 10/27/08</td>
<td>Mon 11/10/08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finalize the requirement specification</td>
<td>2 days?</td>
<td>Mon 10/27/08</td>
<td>Tue 10/29/08</td>
<td></td>
<td>Sowmi</td>
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<tr>
<td>Prepare a development plan for automation system</td>
<td>2 days?</td>
<td>Wed 10/29/08</td>
<td>Thu 10/30/08</td>
<td></td>
<td>Suresh</td>
</tr>
<tr>
<td>Create a Test plan automation framework</td>
<td>2 days?</td>
<td>Fri 10/31/08</td>
<td>Mon 11/03/08</td>
<td>39, 40</td>
<td>Suresh and Sowmi</td>
</tr>
<tr>
<td>Prepare a Deployment Plan for the framework</td>
<td>2 days?</td>
<td>Tue 11/4/08</td>
<td>Wed 11/5/08</td>
<td>39, 40, 41</td>
<td>Suresh and Sowmi</td>
</tr>
<tr>
<td>Review the Design phase with the Industrial sponsor and</td>
<td>2 days?</td>
<td>Thu 11/6/08</td>
<td>Fri 11/7/08</td>
<td>39, 40, 41, 42</td>
<td>Suresh and Sowmi</td>
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<td>Finalize the Design Phase</td>
<td>1 day?</td>
<td>Mon 11/10/08</td>
<td>Mon 11/10/08</td>
<td>43</td>
<td>Suresh and Sowmi</td>
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<tr>
<td>Review the Final Project Scope and Schedule</td>
<td>4 days?</td>
<td>Tue 11/11/08</td>
<td>Fri 11/14/08</td>
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<td></td>
</tr>
<tr>
<td>Modify the Project Scope and Schedule if required</td>
<td>4 days?</td>
<td>Tue 11/11/08</td>
<td>Fri 11/14/08</td>
<td>44, 43</td>
<td>Suresh and Sowmi</td>
</tr>
<tr>
<td>Finalize Project Scope and Schedule</td>
<td>1 day?</td>
<td>Thu 11/13/08</td>
<td>Thu 11/14/08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submit the Final Project scope and schedule report and</td>
<td>1 day?</td>
<td>Fri 11/15/08</td>
<td>Fri 11/15/08</td>
<td>47, 48, 49</td>
<td>Suresh and Sowmi</td>
</tr>
<tr>
<td>Implementation phase</td>
<td>35 days?</td>
<td>Mon 11/24/08</td>
<td>Fri 1/19/09</td>
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<td></td>
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<tr>
<td>Start coding the framework to test the OCA module</td>
<td>30 days?</td>
<td>Mon 11/24/08</td>
<td>Fri 1/20/09</td>
<td>40</td>
<td>Suresh and Sowmi</td>
</tr>
<tr>
<td>Unit testing of framework</td>
<td>5 days?</td>
<td>Mon 1/5/09</td>
<td>Mon 1/5/09</td>
<td>50</td>
<td>Suresh and Sowmi</td>
</tr>
<tr>
<td>Testing and Quality Assurance phase</td>
<td>30 days?</td>
<td>Mon 1/12/09</td>
<td>Fri 2/20/09</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>Review the Test plan</td>
<td>3 days?</td>
<td>Mon 1/12/09</td>
<td>Wed 1/14/09</td>
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<td></td>
</tr>
<tr>
<td>Create Test cases</td>
<td>7 days?</td>
<td>Thu 1/15/09</td>
<td>Fri 1/23/09</td>
<td>53</td>
<td>Suresh and Sowmi</td>
</tr>
<tr>
<td>Start System testing</td>
<td>15 days?</td>
<td>Mon 1/26/09</td>
<td>Fri 2/1/09</td>
<td>54</td>
<td>Suresh and Sowmi</td>
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<tr>
<td>First progress report due</td>
<td>1 day?</td>
<td>Fri 2/1/09</td>
<td>Fri 2/1/09</td>
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<tr>
<td>Review the code to make necessary changes</td>
<td>4 days?</td>
<td>Mon 2/9/09</td>
<td>Thu 2/12/09</td>
<td>55</td>
<td>Suresh and Sowmi</td>
</tr>
<tr>
<td>Integration testing</td>
<td>6 days?</td>
<td>Fri 2/13/09</td>
<td>Fri 2/20/09</td>
<td>57</td>
<td>Suresh</td>
</tr>
<tr>
<td>Economic Justification</td>
<td>30 days?</td>
<td>Tue 2/3/09</td>
<td>Mon 3/16/09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market size</td>
<td>4 days?</td>
<td>Tue 2/5/09</td>
<td>Fri 2/5/09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business and Revenue model</td>
<td>1 day?</td>
<td>Tue 2/10/09</td>
<td>Tue 2/10/09</td>
<td></td>
<td>Suresh</td>
</tr>
<tr>
<td>Santa Barbara chart and OCA for business plan</td>
<td>2 days?</td>
<td>Wed 2/11/09</td>
<td>Mon 2/15/09</td>
<td></td>
<td>Suresh</td>
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**Figure 14: Gantt chart 2**
### Figure 15: Gantt chart 3

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<th>Task Name</th>
<th>Duration</th>
<th>Start</th>
<th>Finish</th>
<th>Predecessor</th>
<th>Resource Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>52 Economic Justification</td>
<td>30 days?</td>
<td>Tue 2/3/09</td>
<td>Mon 3/16/09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 Market size</td>
<td>4 days?</td>
<td>Tue 2/6/09</td>
<td>Fri 2/6/09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61 Business and Revenue model</td>
<td>1 day?</td>
<td>Tue 2/10/09</td>
<td>Tue 2/10/09</td>
<td>Santa</td>
<td></td>
</tr>
<tr>
<td>62 Create Balance sheet and Cash flow statement</td>
<td>4 days?</td>
<td>Wed 2/11/09</td>
<td>Mon 2/16/09</td>
<td>Suresh</td>
<td></td>
</tr>
<tr>
<td>63 ROI</td>
<td>6 days?</td>
<td>Mon 3/9/09</td>
<td>Mon 3/16/09</td>
<td>Suresh</td>
<td></td>
</tr>
<tr>
<td>64 Deployment Phase</td>
<td>17 days?</td>
<td>Mon 2/23/09</td>
<td>Tue 3/17/09</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>65 Integrate the system with the existing framework</td>
<td>6 days?</td>
<td>Mon 2/23/09</td>
<td>Mon 3/2/09</td>
<td>Suresh</td>
<td></td>
</tr>
<tr>
<td>66 Second progress report due</td>
<td>1 day?</td>
<td>Fri 3/6/09</td>
<td>Fri 3/6/09</td>
<td>Santa, Suresh, Suresh, Suvana</td>
<td></td>
</tr>
<tr>
<td>67 Test the compatibility</td>
<td>5 days?</td>
<td>Mon 3/9/09</td>
<td>Fri 3/13/09</td>
<td>Suresh</td>
<td>65 Suresh</td>
</tr>
<tr>
<td>68 Review and make modification</td>
<td>2 days?</td>
<td>Mon 3/16/09</td>
<td>Tue 3/17/09</td>
<td>Santa, Suresh and Suvana</td>
<td>66 Suresh</td>
</tr>
<tr>
<td>69 Sign off</td>
<td>2 days?</td>
<td>Thu 3/19/09</td>
<td>Fri 3/20/09</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>70 Handover the test framework to Regression team</td>
<td>1 day?</td>
<td>Thu 3/19/09</td>
<td>Thu 3/19/09</td>
<td>Santa, Suresh and Suvana</td>
<td>69 Suresh and Suvana</td>
</tr>
<tr>
<td>71 Final report for review</td>
<td>1 day?</td>
<td>Fri 3/20/09</td>
<td>Fri 3/20/09</td>
<td>70</td>
<td>Santa, Suresh, Suvana</td>
</tr>
<tr>
<td>72 Final submission Presentation</td>
<td>1 day?</td>
<td>Fri 4/5/09</td>
<td>Fri 4/5/09</td>
<td>Suvana</td>
<td></td>
</tr>
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</table>
## 8.16.2 Critical tasks

<table>
<thead>
<tr>
<th>ID</th>
<th>Task Name</th>
<th>Start</th>
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<tbody>
<tr>
<td>1</td>
<td>Automation testing to improve the Productivity</td>
<td>Fri 8/29/08</td>
<td>Fri 4/3/09</td>
</tr>
<tr>
<td>2</td>
<td>Objective</td>
<td>Fri 8/29/08</td>
<td>Wed 9/3/08</td>
</tr>
<tr>
<td>3</td>
<td>Selection of Topic</td>
<td>Fri 8/29/08</td>
<td>Wed 9/3/08</td>
</tr>
<tr>
<td>7</td>
<td>Planning</td>
<td>Fri 8/29/08</td>
<td>Fri 9/26/08</td>
</tr>
<tr>
<td>8</td>
<td>Team Formation</td>
<td>Fri 8/29/08</td>
<td>Fri 9/12/08</td>
</tr>
<tr>
<td>14</td>
<td>Define the scope of the project</td>
<td>Mon 9/15/08</td>
<td>Fri 9/26/08</td>
</tr>
<tr>
<td>24</td>
<td>Submit Project, Schedule report and Presentation</td>
<td>Fri 9/26/08</td>
<td>Fri 9/25/08</td>
</tr>
<tr>
<td>25</td>
<td>Literature Review</td>
<td>Mon 9/29/08</td>
<td>Fri 10/10/08</td>
</tr>
<tr>
<td>26</td>
<td>Research coding language(, c, c++, Perl, Java)</td>
<td>Mon 9/29/08</td>
<td>Fri 10/3/08</td>
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### Figure 16: Critical task 1
**Figure 17: Critical task 2**

<table>
<thead>
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<th>Task Name</th>
<th>Start</th>
<th>Finish</th>
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<tbody>
<tr>
<td>37</td>
<td>Submit the presentation and Economic Analysis report</td>
<td>Fri 10/24/08</td>
<td>Fri 10/24/08</td>
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<tr>
<td>45</td>
<td>Review the Final Project Scope and Schedule</td>
<td>Tue 11/11/08</td>
<td>Fri 11/14/08</td>
</tr>
<tr>
<td>47</td>
<td>Finalize Project Scope and Schedule</td>
<td>Thu 11/13/08</td>
<td>Thu 11/13/08</td>
</tr>
<tr>
<td>48</td>
<td>Submit the Final Project scope and schedule report and presentation</td>
<td>Fri 11/14/08</td>
<td>Fri 11/14/08</td>
</tr>
<tr>
<td>72</td>
<td>Final submission Presentation</td>
<td>Fri 4/3/09</td>
<td>Fri 4/3/09</td>
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</table>
### 8.16.3 Milestone tasks

<table>
<thead>
<tr>
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<th>Task Name</th>
<th>Duration</th>
<th>Start</th>
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<tbody>
<tr>
<td>1</td>
<td>Automation testing to improve the Productivity</td>
<td>158 days</td>
<td>Fri 8/29/08</td>
</tr>
<tr>
<td>2</td>
<td>Objective</td>
<td>4 days</td>
<td>Fri 8/29/08</td>
</tr>
<tr>
<td>3</td>
<td>Selection of Topic</td>
<td>4 days</td>
<td>Fri 8/29/08</td>
</tr>
<tr>
<td>7</td>
<td>Planning</td>
<td>21 days</td>
<td>Fri 8/29/08</td>
</tr>
<tr>
<td>8</td>
<td>Team Formation</td>
<td>11 days</td>
<td>Fri 8/29/08</td>
</tr>
<tr>
<td>14</td>
<td>Define the scope of the project</td>
<td>10 days</td>
<td>Mon 9/15/08</td>
</tr>
<tr>
<td>20</td>
<td>Define the Project schedule</td>
<td>5 days</td>
<td>Mon 9/15/08</td>
</tr>
<tr>
<td>24</td>
<td>Submit Project Schedule report and Presentation</td>
<td>1 day</td>
<td>Fri 9/25/08</td>
</tr>
<tr>
<td>25</td>
<td>Literature Review</td>
<td>10 days</td>
<td>Mon 9/29/08</td>
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<tr>
<td>30</td>
<td>Final draft of Literature Review report</td>
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<td>Wed 10/8/08</td>
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<tr>
<td>32</td>
<td>Economic Analysis</td>
<td>10 days</td>
<td>Mon 10/13/08</td>
</tr>
<tr>
<td>35</td>
<td>Make the necessary changes to the project</td>
<td>2 days</td>
<td>Tue 10/21/08</td>
</tr>
<tr>
<td>45</td>
<td>Review the Final Project Scope and Schedule</td>
<td>4 days</td>
<td>Tue 11/11/08</td>
</tr>
<tr>
<td>48</td>
<td>Submit the Final Project scope and schedule report and presentation</td>
<td>1 day</td>
<td>Fri 11/14/08</td>
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<tr>
<td>59</td>
<td>Economic Justification</td>
<td>30 days</td>
<td>Tue 2/3/09</td>
</tr>
<tr>
<td>64</td>
<td>Deployment Phase</td>
<td>17 days</td>
<td>Mon 2/23/09</td>
</tr>
<tr>
<td>66</td>
<td>Second progress report due</td>
<td>1 day</td>
<td>Fri 2/20/09</td>
</tr>
<tr>
<td>63</td>
<td>ROI</td>
<td>6 days</td>
<td>Mon 2/19/09</td>
</tr>
<tr>
<td>69</td>
<td>Sign off</td>
<td>2 days</td>
<td>Thu 3/19/09</td>
</tr>
<tr>
<td>71</td>
<td>Final report for review</td>
<td>1 day</td>
<td>Fri 3/20/09</td>
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</tbody>
</table>

**Figure 18: Milestone tasks**
9 Conclusion

The test automation framework developed by us as part of our Master’s project has significantly improved the testing efficiency and reduced the test cycle time for our industrial sponsor Tellabs 8800 series router. Further, the generalized test architecture approach that we implemented will help the entire telecom industry in reducing the testing costs and improving the productivity. This report also details the economic justification of developing and pursuing a test automation project. The analysis on the market potential demonstrates that ROI as high as 550% from test automation within a span of five years period. Study on market potential, competitors and the potential customers ensure that the developed product has major differentiation from the competitor’s product and is highly appealing to our potential customers.
10 Tools and Resources

The test automation project identified in this report required the following resources.

1. **Tellabs 8800 series router** (a telecom network element): This router was the unit under test, as a part of this project. The test automation scripts validated whether router is functioning as expected for particular features.

2. **UNIX server**: The server used to run TCL and shell scripts.

3. **UNIX operating system**: UNIX operating system runs on the servers.

4. **Telnet client**: The telnet client such as putty or TeraTerm for opening telnet session to the UNIX server and Tellabs 8800 series router.

5. **TCL interpreter & libraries**: Multiple scripts for common functions stored in TCL libraries.

6. **Test Scripts**: Scripts to run automated testing for selected feature testing.

7. **Martin Luther King library**: Journals, books and online databases from Martin Luther King Library provided material for literature survey.

8. **Internet**: The websites such as Yahoo, Google, and Wikipedia were key source for economic survey and analysis.

9. **Engr-298** Class material for economic justification and other guidelines.
## 11 Glossary of Terms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tr>
<td>ALM</td>
<td>Application life cycle Management</td>
</tr>
<tr>
<td>ATM</td>
<td>Asynchronous Transfer Mode</td>
</tr>
<tr>
<td>CLI</td>
<td>Command Line Interface</td>
</tr>
<tr>
<td>DUT</td>
<td>Device under test</td>
</tr>
<tr>
<td>FR</td>
<td>Frame Relay</td>
</tr>
<tr>
<td>FRD</td>
<td>Feature requirement document</td>
</tr>
<tr>
<td>HW</td>
<td>Hardware</td>
</tr>
<tr>
<td>IDC</td>
<td>International Data Corporation</td>
</tr>
<tr>
<td>IP</td>
<td>Internet Protocol</td>
</tr>
<tr>
<td>LAN</td>
<td>Local Area Network</td>
</tr>
<tr>
<td>MPLS</td>
<td>Multiprotocol Label Switching</td>
</tr>
<tr>
<td>MSR</td>
<td>Multi Services Router</td>
</tr>
<tr>
<td>OSI</td>
<td>Open Systems Interface</td>
</tr>
<tr>
<td>PRD</td>
<td>Product Requirement document</td>
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<tr>
<td>QA</td>
<td>Quality Assurance</td>
</tr>
<tr>
<td>QoS</td>
<td>Quality of Service</td>
</tr>
<tr>
<td>ROI</td>
<td>Return on Investment</td>
</tr>
<tr>
<td>SW</td>
<td>Software</td>
</tr>
<tr>
<td>TCL</td>
<td>Tool Command Language</td>
</tr>
<tr>
<td>VOIP</td>
<td>Voice over IP</td>
</tr>
<tr>
<td>WiMAX</td>
<td>Worldwide Interoperability for Microwave Access</td>
</tr>
</tbody>
</table>
12 Team and Committee

Faculty Reader:

Dr. Jim Dorosti: “Dr. Dorosti is the Director of MSE Programs, College of Engineering at San Jose State University where he also teaches engineering courses in the MSE program and mentors young engineering students. He serves on the following committees: MSE Steering; College of Engineering Curriculum; High Tech Management; and Entrepreneurship Excellence. Jim has extensive experience with Fortune 500 and start-up businesses in the semiconductor industry, and a unique record in managing both technical organizations as well as Corporate Total Quality Management Systems (TQMS).” (San Jose State University, 2008)

Industrial Sponsor:

Mr. Surya Rao: Mr. Rao is a Senior Manager at Tellabs and he has over 16 years of industrial experience. At Tellabs, he is leading an aggressive team of engineers who are involved in the development of next generation router products. Prior to his job at Tellabs, he has managed development teams in many top-notch companies such as Motorola, Fujitsu and CMC India. Mr. Rao is a champion of automation testing implementations and designed many automation schemes in the above companies.
Team members:

Suresh Babu Thuravupala: Suresh Babu Thuravupala is a full time graduate student at San Jose State University. He has many years of experience on telecom and networking products from companies such as Tellabs, Cisco, Nokia, Verilink, Ciena, TATA (India), HCL Comnet (India) and Indian Telephone Industries (India). With his many years of experience in testing and software development, he will bring in a rich expertise and will play a very important role in developing, testing and implementing the Automation test tool planned for this project.

Sarita Agrawal: Sarita Agrawal is a full time student at San Jose State University and an IT Analyst Intern at Cisco Systems, Inc. With 3 years of industry experience as a software developer and Quality Assurance Engineer, she will play an important role in defining the scope and timely completion of the project.

Suvarna Khadke: Suvarna Khadke is a full time student at San Jose State University. She has hands on experience in software testing and various programming languages. She will help in designing the front end user interface tool and in completing the project in time.
13 References


Free Spreadsheets, Retrieved October 8, 2008 from www.exinfm.com


Appendix-A

The following library files are used for performing automation testing on Tellabs 8800 series router. These library files act as common procedures and script files call them.

Module-1: Library Files

Library File-1

```
proc connect8800 { outVar host {username abcd} {password abcd.1} } {
    set prompt "(#) $"
    upvar $outVar out;
    set out(spawnID) 0
    set timeout 180
    spawn telnet $host
    set id $spawn_id
    puts "$spawnID is $id"
    set out(spawnID) $id
    expect "Login:"
    exp_send "rootxxxxx\r"
    expect "Password:"
    exp_send "xxxxroot.1\r"
    expect -re $prompt
    set out(buff) "##### $expect_out(buffer) ###"
    sleep 2
}
```

Library file-2

```
proc issueCommand {outVar id cmd {params ""}} {
    upvar $outVar out
    #initOutVar out 1
    parseArgs args $params
    set hitenter 3; if [info exists args(hitenter)] {set hitenter $args(hitenter)}
    set ctrlc 1; if [info exists args(ctrlc)] {set ctrl $args(ctrlc)}
    set time 10;
    set time 1
    if [info exists args(time)] {set time $args(time)}
    # set prompt "\(^\[\^\r\]*\)\r\n"
    set prompt "(#) $"
    if [info exists args(prompt)] {set prompt $args(prompt)}
    set timeout $time
    set retries 0
    set out(output) ""
    if ![regexp {^ *$} $cmd] {
        #if {[fork] == 0} {
            # sleep $time
            #send -i $id "\03
```
# exit
#
set str [string trim $cmd]
send -i $id "$str\r"
expect {
    -i $id
    -re $prompt {
        append out(output) $expect_out(buffer)
        exp_continue
    }
    -re "((%|>|#|\$) $)" {
        set lines [split $out(output) \r\n]
        foreach l $lines {
            if {[regexp "segmentation|core dump|bus error|usage:|command not found" $l]} {
                errMsg out $l
            }
        }
    }
    full_buffer {
        append out(output) $expect_out(buffer)
        exp_continue
    }
}

Library File-3

proc issueCommandWithTout {outVar id delay cmd {params ""}} {
    upvar $outVar out
    #initOutVar out 1
    parseArgs args $params
    set hitenter 3; if [info exists args(hitenter)] {set hitenter $args(hitenter)}
    set ctrlc 1; if [info exists args(ctrlc)] {set ctrl $args(ctrlc)}
    set time 10;
    set time 1
    set timeout $delay
    #set timeout -1
    if [info exists args(time)] {set time $args(time)}
    #    set prompt "(\[\^[\r]*\r\n"
    #    set prompt "(#) "$"
    if [info exists args(prompt)] {set prompt $args(prompt)}
    #    set timeout $time
    set retries 0
    set out(output) ""
    if {![regexp {^ *$} $cmd]} {
        #if {[fork] == 0} {
            #    sleep $time
            #    send -i $id "\03"
# exit
#
set str [string trim $cmd]
send -i $id "$str\r"

#set timeout -1
expect {
    -i $id
    -re $prompt {
        append out(output) $expect_out(buffer)
        exp_continue
    }
    timeout {
        puts "##########################TIMEOUTOCCURED##########################"
        -re "(%|>|#|\$) $" {
            set lines [split $out(output) \r\n]
            foreach l $lines {
                if {[regexp "segmentation|core dump|bus error|usage:|command not foun d" $l]}) {
                    errMsg out $l
                }
            }
        }
    } full_buffer {
        append out(output) $expect_out(buffer)
        exp_continue
    }
}

Library File-4

proc issueCommand1 {outVar id tout cmd  {params ""}} {
    set timeout $tout
    upvar $outVar out
    set out(output) ""
    set moreString ""
    set prompt "(#|>|%|\$) "$"
send -i $id "$cmd \r"
expect {
    -i $id
    -re (.*)|--More--|$prompt) {puts "--More-- OR prompt got"
    #-re "(.*)# $" puts "more got"
    #-re (.*)\$prompt) puts "more got"
    #-re (.*) puts "more got"
    append out(output) $expect_out(buffer) } }
puts "expect_out(1,string) is $expect_out(1,string)"
puts "expect_out(2,string) is $expect_out(2,string)"
#if {
    [string match --More-- $expect_out(2,string)]
}
while {([string match --More-- $expect_out(2,string)])} {
set expect_out(2,string) ""
send -i $id "\x20 \r"
expect {
  -i $id
  -re (.*)(--More--|$prompt) { puts "more got"
    append out(output) $expect_out(1,string) } }
#append out(output) $expect_out(buffer)
puts "expect_out(1,string) is $expect_out(1,string)"
puts "expect_out(2,string) is $expect_out(2,string)"
}
proc parseArgs {outVar actualArgs} {
  upvar $outVar out;
  # initOutVar out
  set totalArgs [llength $actualArgs]
  set i -1
  while {$i < ($totalArgs - 1)} {
    incr i
    set argValue [lindex $actualArgs $i]
    # letters, digits, underscore and dashes
    set result [regexp -nocase {(\-)([A-Za-z0-9_\-]+)} $argValue b c actValue]
    if  {$result} {
      incr i
      # replaces the value of argName to NULL if nothing exists
      if  {([regexp -nocase {(\-)([A-Za-z0-9_\-]+)} [lindex $actualArgs $i]]} {
        set out($actValue) ""
        incr i -1
      } else {
        set out($actValue) [lindex $actualArgs $i]
      }
    } else {
      errMsg out "parseArgs : Illegal argument name <$argValue>.
      $actualArgs"
      return
    }
  }
} ; # end of parseArgs procedure
proc enableAdminMultiVTs {outVar id startVTG endVTG startVT endVT} {
  upvar $outVar out

for {set VTGcount $startVTG} {$VTGcount <= $endVTG} {incr VTGcount} {
    for {set VTCount $startVT} {$VTCount <= $endVT} {incr VTCount} {
        #puts "VT-$VTGcount-$VTCount"
        issueCommand out $id "vt-options $VTGcount/$VTCount admin enable"
        #issueCommand out $id "exit"
    }
}
******************************************************************************
Library File-7
******************************************************************************
proc enableAdminMultiDS1s {outVar id startVTG endVTG startVT endVT} {
    upvar $outVar out
    for {set VTGcount $startVTG} {$VTGcount <= $endVTG} {incr VTGcount} {
        for {set VTCount $startVT} {$VTCount <= $endVT} {incr VTCount} {
            #puts "VT-$VTGcount-$VTCount"
            issueCommand out $id "ds1-options $VTGcount/$VTCount admin enable"
            #issueCommand out $id "enable config equip channel ds1-options $VTGcount/$VTCount admin enable"
            #issueCommand out $id "exit"
        }
    }
}
******************************************************************************
Module-2: Script files
The following TCL/EXPECT script file was developed as part of this automation testing project for generating 2000 IP interfaces on Tellabs 8800
#name Create2000_IPint.exp
******************************************************************************
#!/bin/sh
#package require Expect
set starter { $*
    shift 2
}
source //home/stthuravu/myPrograms/SurTlab_Routerlib.tcl
******************************************************************************
#8800 Automation scripts to create up to 2000 (bundles,ATM L2,L3 IP)subinterfaces
#Usage: ./program name , example "./2000ATMandIPint.exp"
#CAUTION:-This program will erase existing configuration and create 2000 Bundles, 2000 L2 ATM UNI interfaces and 2000 L3 IP sub interfaces on the router specified by the IP address
******************************************************************************
set slots { 9 } ; # specify the slot on which interfaces to be created
set prompt "(#) "$
if ( $argc==0) {
    # puts "missing SW ver Argument, USAGE is $argv0 followed by
    # extension of software version"
    # puts "example $argv0 162002"
    # exit
}

#######################################################################
# provide the list of node IP addresses below
#######################################################################
set ips "172.24.220.31 172.24.220.37" ; # 8860 and 8840- SW ver 7.3
Nodes
#set codeSrvrIP 172.24.80.18 ;  # tftpserver for SW to be downloaded
set Ver [lindex $argv 0]
set swVer 7.0.x.x.$Ver
foreach ip $ips {
    connect8800 out $ip xxxx xxxx.8800
    set id1 $out(spawnID)
    send -i $id1 "enable config terminal global-pagination disable
    "
    issueCommand out $id1 "show ver"
    $out(output) m m1 ver
    puts "initial SW version is $ver 
    puts
    "######################################################################## 
    puts "BEGIN admin enabling VTs and DS1s"
    puts
    "######################################################################## 
    issueCommand out $id1 "sh event current-table"
    issueCommand out $id1 "show node extensive"
    issueCommand out $id1 "show equip line-module"
    #issueCommand out $id1 "enable config equip channel so-1/9/1/1:1"
    foreach slot $slots {
        foreach module {1 2 3 4 } {
            foreach port {1 2} {
                foreach channel {1 2 3} {
                    issueCommand out $id1 "enable conf equip port so-
                    l/$slot/$module/$port sonet channel stsl $channel "
                    issueCommand out $id1 "admin enable"
                    enableAdminMultiVTs out $id1 1 7 1 4
                    enableAdminMultiDS1s out $id1 1 7 1 4
                    issueCommand out $id1 "exit"
                    issueCommand out $id1 "show equip channel so-
                    l/$slot/$module/$port:$channel vt"
                } ; # end of foreach channel
            } ; # end of foreach port
        } ; # end of foreach module
    } ; # end of foreach slot
}
puts "########################################################################### "
puts "BEGIN creating bundles, L2 ATM interfaces and L3 IP subinterfaces"
puts "########################################################################### "
#set ipPrefix 1 ; #set this as 1 if all slots are used and we want to start from beginning, else set to which slot you want to start with
set ipPrefix 3 ; # will start ip address like 3.1.1.1/24 signifying 3rd slot
foreach slot $slots {
    set ipSN $ipPrefix
    set ipPrefix [expr $ipPrefix+1]
    foreach module {1 2 3 4 } {
        foreach port {1 2} {
            foreach channel {1 2 3} {
                set ds1Num 1
                createMultiDS1timeSlots out $id1 $slot $module $port $channel $ds1Num 1 7 1 4
                createL2BundleInt out $id1 $slot $module $port $channel $ipSN
            } ; #end of foreach channel
        } ; #end of foreach port
    } ; #end of foreach module
}
exit 1 ; # end of program

=============
Module 3: LOG file from running automation on Tellabs 8800 router
=============

spawn telnet 1xx.24.220.xx
spawnID is 4
Trying 1xx.24.220.xx...
Connected to 1xx.24.220.xx.
Escape character is '^[]'.

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
* * * * *
* *
* Welcome to Tellabs Multi-service OS Command Line Interface
* *
* *
* Tellabs, Inc.
Login: xxxxx
Password:

root logged in, 03/20/2009 17:46:16

8840-40# enable config terminal global-pagination disable
8840-40# show ver

Software Version: 99.0.0.0.165473

8840-40# initial SW version is 99.0.0.0.165473

# admin enabling VTs using Automation script
# show event current-table

LEGEND:
Severity:   C: Critical, M: Major, m: Minor, I: Info

<table>
<thead>
<tr>
<th>S</th>
<th>Seq.</th>
<th>e Description</th>
<th>Text/Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>252</td>
<td>PORT so-1/7/2/2</td>
<td>sonet Alarm LOS</td>
</tr>
<tr>
<td></td>
<td>1231</td>
<td>PORT so-1/7/1/1</td>
<td>sonet Alarm LOS</td>
</tr>
</tbody>
</table>

8840-40# show node extensive

Node Number: 1; Name: -; Product: Tellabs8840
Customer Name: -; Location: -
Contact: -
Description: -
Time zone: UTC; System Up Time: 8 days, 1:23:50.00 (hr:min:sec)
Statistics poll timer interval: 15 minutes; Statistics archival: disabled
Last Restart Reason: operator requested; Switch-over Mode: enabled
Switch-over oscillation count: 3; System initiated Sw-over Locked: No
Last switch-over [ none ] time: not available
Last switch-over reason: none
Last switch-over status: none
Redundancy Status: fully Redundant
Secondary Redundancy Status: none
Active Status: fully Active
Suppress Alarm: [ Power Source 1: no ] [ Power Source 4: no ]
Switch Fabric Status: normal
Node Upgrade Operation: idle

Node Software Version Information:
LEGEND: Op status:  up : Up,  dn : down,  ts : testing
Image status:  R: Running,  C: Complete,  L: Loading,  V: Valid
u: Unknown,  I: Invalid,  ch: Caching

<table>
<thead>
<tr>
<th>Crd Op Image1</th>
<th>Sts</th>
<th>Image2</th>
<th>Sts</th>
<th>Select Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1* up 99.0.0.0.165473 R</td>
<td>99.0.0.0.165098 C</td>
<td>99.0.0.0.165473</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2 dn not available</td>
<td>I</td>
<td>not available</td>
<td>I</td>
<td>99.0.0.0.165473</td>
</tr>
<tr>
<td>S3 up 99.0.0.0.165473 R</td>
<td>99.0.0.0.165098 C</td>
<td>99.0.0.0.165473</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L1 dn not available</td>
<td>I</td>
<td>not available</td>
<td>I</td>
<td>99.0.0.0.165473</td>
</tr>
<tr>
<td>L2 dn not available</td>
<td>I</td>
<td>not available</td>
<td>I</td>
<td>99.0.0.0.165473</td>
</tr>
<tr>
<td>L3 dn not available</td>
<td>I</td>
<td>not available</td>
<td>I</td>
<td>99.0.0.0.165473</td>
</tr>
<tr>
<td>L4 dn not available</td>
<td>I</td>
<td>not available</td>
<td>I</td>
<td>99.0.0.0.165473</td>
</tr>
<tr>
<td>L5 up 4.0.0.3.107503 C</td>
<td>99.0.0.0.165473 R</td>
<td>99.0.0.0.165473</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L6 up 99.0.0.0.165098 C</td>
<td>99.0.0.0.165473 R</td>
<td>99.0.0.0.165473</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L7 up 99.0.0.0.165473 R</td>
<td>99.0.0.0.165098 C</td>
<td>99.0.0.0.165473</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L8 dn not available</td>
<td>I</td>
<td>not available</td>
<td>I</td>
<td>99.0.0.0.165473</td>
</tr>
<tr>
<td>L9 up 99.0.0.0.165473 R</td>
<td>5.1.0.2.135595 C</td>
<td>99.0.0.0.165473</td>
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<td></td>
</tr>
<tr>
<td>L10 dn not available</td>
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<td>99.0.0.0.165473</td>
</tr>
<tr>
<td>L11 dn not available</td>
<td>I</td>
<td>not available</td>
<td>I</td>
<td>99.0.0.0.165473</td>
</tr>
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</table>
8840-40# show equip line-module

<table>
<thead>
<tr>
<th>LineMod Idx</th>
<th>Admin</th>
<th>Op</th>
<th>Cfg Type</th>
<th>Act Type</th>
</tr>
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<tbody>
<tr>
<td>Equip State</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
<td>----</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>1/6/1</td>
<td>enable</td>
<td>up</td>
<td>oc3-stm1-atm</td>
<td>oc3-stm1-atm</td>
</tr>
<tr>
<td>plugged</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/6/2</td>
<td>enable</td>
<td>up</td>
<td>oc3-stm1-atm</td>
<td>oc3-stm1-atm</td>
</tr>
<tr>
<td>plugged</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/6/3</td>
<td>enable</td>
<td>up</td>
<td>oc3-stm1-atm</td>
<td>oc3-stm1-atm</td>
</tr>
<tr>
<td>plugged</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/6/4</td>
<td>enable</td>
<td>up</td>
<td>oc3-stm1-atm</td>
<td>oc3-stm1-atm</td>
</tr>
<tr>
<td>plugged</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/7/1</td>
<td>enable</td>
<td>up</td>
<td>oc3-stm1-atm</td>
<td>oc3-stm1-atm</td>
</tr>
<tr>
<td>plugged</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1/7/2</td>
<td>enable</td>
<td>up</td>
<td>oc3-stm1-atm</td>
<td>oc3-stm1-atm</td>
</tr>
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</tr>
<tr>
<td>1/7/3</td>
<td>enable</td>
<td>up</td>
<td>oc3-stm1-atm</td>
<td>oc3-stm1-atm</td>
</tr>
<tr>
<td>plugged</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1/7/4</td>
<td>enable</td>
<td>up</td>
<td>oc3-stm1-atm</td>
<td>oc3-stm1-atm</td>
</tr>
<tr>
<td>plugged</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/9/1</td>
<td>enable</td>
<td>up</td>
<td>oc3-stm1-atm</td>
<td>oc3-stm1-atm</td>
</tr>
<tr>
<td>plugged</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1/9/2</td>
<td>enable</td>
<td>up</td>
<td>oc3-stm1-atm</td>
<td>oc3-stm1-atm</td>
</tr>
<tr>
<td>plugged</td>
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</tr>
<tr>
<td>1/9/3</td>
<td>enable</td>
<td>up</td>
<td>oc3-stm1-atm</td>
<td>oc3-stm1-atm</td>
</tr>
<tr>
<td>plugged</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/9/4</td>
<td>enable</td>
<td>up</td>
<td>oc3-stm1-atm</td>
<td>oc3-stm1-atm</td>
</tr>
</tbody>
</table>
plugged

8840-40# enable config equip port so-1/6/1/1_ sonet-options channel stsl 1
8840-40# enable config equip channel so-1/6/1/1:1
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 1_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 1_2 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 1_3 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 1_4 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 2_1 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 2_2 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 2_3 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 2_4 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 3_1 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 3_2 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 3_3 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 3_4 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 4_1 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 4_2 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 4_3 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 4_4 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])# vt-options 5_1 admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# vt-options 5/2_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# vt-options 5/3_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# vt-options 5/4_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# vt-options 6/1_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# vt-options 6/2_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# vt-options 6/3_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# vt-options 6/4_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# vt-options 6/5_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# vt-options 6/6_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# vt-options 6/7_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 1/1_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 1/2_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 1/3_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 1/4_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 2/1_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 2/2_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 2/3_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 2/4_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 3/1_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 3/2_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 3/3_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 3/4_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 4/1_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 4/2_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 4/3_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 4/4_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 5/1_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 5/2_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 5/3_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 5/4_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 6/1_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 6/2_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 6/3_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 6/4_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 7/1_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 7/2_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 7/3_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# ds1-options 7/4_ admin enable
8840-40(cfg-ch [so-1/6/1/1:1])  )# exit
8840-40# enable config equip port so-1/6/1/1 sonet-options channel stsi 2
8840-40# enable config equip channel so-1/6/1/1:2
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 1/1_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 1/2_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 1/3_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 1/4_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 2/1_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 2/2_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 2/3_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 2/4_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 3/1_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 3/2_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 3/3_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 3/4_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 4/1_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 4/2_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 4/3_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 4/4_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 5/1_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 5/2_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 5/3_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 5/4_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 6/1_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 6/2_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 6/3_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 6/4_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 7/1_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 7/2_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 7/3_ admin enable
8840-40 (cfg-ch [so-1/6/1/1:2])  )# vt-options 7/4_ admin enable
vt-options 3/4 admin enable
dsl-options 1/1 admin enable
dsl-options 1/2 admin enable
dsl-options 1/3 admin enable
dsl-options 1/4 admin enable
dsl-options 2/1 admin enable
dsl-options 2/2 admin enable
dsl-options 2/3 admin enable
dsl-options 2/4 admin enable
dsl-options 3/1 admin enable
dsl-options 3/2 admin enable
dsl-options 3/3 admin enable
dsl-options 3/4 admin enable
dsl-options 4/1 admin enable
dsl-options 4/2 admin enable
dsl-options 4/3 admin enable
dsl-options 4/4 admin enable
vt-options 4/1 admin enable
dsl-options 5/1 admin enable
dsl-options 5/2 admin enable
dsl-options 5/3 admin enable
dsl-options 5/4 admin enable
dsl-options 6/1 admin enable
dsl-options 6/2 admin enable
dsl-options 6/3 admin enable
dsl-options 6/4 admin enable
vt-options 6/1 admin enable
vt-options 6/2 admin enable
vt-options 6/3 admin enable
vt-options 6/4 admin enable
vt-options 7/1 admin enable
vt-options 7/2 admin enable
vt-options 7/3 admin enable
vt-options 7/4 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # vt-options 2/2 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # vt-options 2/3 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # vt-options 2/4 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # vt-options 3/1 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # vt-options 3/2 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # vt-options 3/3 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # vt-options 3/4 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # vt-options 4/1 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # vt-options 4/2 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # vt-options 4/3 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # vt-options 4/4 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 1/1 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 1/2 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 1/3 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 1/4 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 2/1 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 2/2 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 2/3 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 2/4 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 3/1 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 3/2 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 3/3 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 3/4 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 4/1 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 4/2 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 4/3 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 4/4 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 5/1 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 5/2 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 5/3 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 5/4 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 6/1 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 6/2 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 6/3 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 6/4 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 7/1 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 7/2 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 7/3 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # ds1-options 7/4 admin enable
8840-40 (cfg-ch [so-1/6/1/1:3]) # exit
8840-40 # enable config equip port so-1/6/1/2 sonet-options channel stsl 1
8840-40# enable config equip channel so-1/6/1/2:1
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 1/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 1/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 1/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 1/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 2/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 2/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 2/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 2/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 3/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 3/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 3/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 3/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 4/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 4/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 4/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 4/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 5/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 5/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 5/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 5/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 6/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 6/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 6/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 6/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 7/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 7/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 7/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# vt-options 7/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 1/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 1/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 1/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 1/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 2/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 2/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 2/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 2/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 3/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 3/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 3/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 3/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 4/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 4/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 4/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 4/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 5/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 5/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 5/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 5/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 6/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 6/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 6/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 6/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 7/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 7/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 7/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 7/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 7/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 7/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# ds1-options 7/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:1])# exit
8840-40# enable config equip port so-1/6/1/2 sonet-options channel stsl 2
8840-40# enable config equip channel so-1/6/1/2:2
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 1/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 1/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 1/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 1/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 2/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 2/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 2/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 2/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 3/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 3/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 3/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 3/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 4/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 4/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 4/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# vt-options 4/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 1/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 1/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 1/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 1/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 2/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 2/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 2/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 2/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 3/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 3/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 3/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 3/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 4/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 4/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 4/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 4/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 5/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 5/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:2])# ds1-options 5/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:2] )# dsl-options 5/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:2] )# dsl-options 6/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:2] )# dsl-options 6/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:2] )# dsl-options 6/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:2] )# dsl-options 6/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:2] )# dsl-options 7/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:2] )# dsl-options 7/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:2] )# dsl-options 7/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:2] )# dsl-options 7/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:2] )# exit
8840-40# enable config equip port so-1/6/1/2_ sonet-options channel stsl 3
8840-40# enable config equip channel so-1/6/1/2:3
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 1/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 1/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 1/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 1/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 2/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 2/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 2/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 2/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 3/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 3/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 3/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 3/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 4/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 4/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 4/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 4/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 5/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 5/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 5/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 5/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 6/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 6/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 6/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 6/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 7/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 7/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 7/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# vt-options 7/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# dsl-options 1/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# dsl-options 1/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# dsl-options 1/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# dsl-options 1/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# dsl-options 2/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# dsl-options 2/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# dsl-options 2/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# dsl-options 2/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# dsl-options 3/1 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# dsl-options 3/2 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# dsl-options 3/3 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# dsl-options 3/4 admin enable
8840-40(cfg-ch [so-1/6/1/2:3] )# dsl-options 4/1 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # dsl-options 4/2 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # dsl-options 4/3 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # dsl-options 4/4 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # dsl-options 5/1 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # dsl-options 5/2 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # dsl-options 5/3 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # dsl-options 5/4 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # dsl-options 6/1 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # dsl-options 6/2 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # dsl-options 6/3 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # dsl-options 6/4 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # dsl-options 7/1 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # dsl-options 7/2 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # dsl-options 7/3 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # dsl-options 7/4 admin enable
8840-40 (cfg-ch [so-1/6/1/2:3]) # exit
8840-40 # enable config equip port so-1/6/2/1 sonet-options channel stsl 1
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 1/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 1/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 1/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 1/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 2/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 2/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 2/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 2/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 3/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 3/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 3/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 3/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 4/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 4/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 4/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 4/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 5/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 5/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 5/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 5/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 6/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 6/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 6/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 6/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 7/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 7/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 7/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # vt-options 7/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # dsl-options 1/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # dsl-options 1/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # dsl-options 1/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # dsl-options 1/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # dsl-options 2/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # dsl-options 2/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # dsl-options 2/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 2/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 3/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 3/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 3/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 3/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 4/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 4/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 4/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 4/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 5/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 5/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 5/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 5/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 6/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 6/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 6/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 6/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 7/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 7/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 7/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # ds1-options 7/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:1]) # exit
8840-40 # enable config equip port so-1/6/2/1 sonet-options channel stsl 2
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 1/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 1/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 1/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 1/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 2/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 2/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 2/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 2/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 3/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 3/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 3/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 3/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 4/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 4/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 4/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 4/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 5/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 5/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 5/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 5/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 6/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 6/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 6/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 6/4 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 7/1 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 7/2 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # vt-options 7/3 admin enable
8840-40 (cfg-ch [so-1/6/2/1:2]) # ds1-options 1/1 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 1/2 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 1/3 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 1/4 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 2/1 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 2/2 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 2/3 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 2/4 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 3/1 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 3/2 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 3/3 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 3/4 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 4/1 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 4/2 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 4/3 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 4/4 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 5/1 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 5/2 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 5/3 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 5/4 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 6/1 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 6/2 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 6/3 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 6/4 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 7/1 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 7/2 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 7/3 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# ds1-options 7/4 admin enable
8840-40(cfg-ch [so-1/6/2/1:2])# exit
8840-40# enable config equip port so-1/6/2/1 sonet-options channel sts1 3
8840-40# enable config equip channel so-1/6/2/1:3
8840-40# enable config equip channel so-1/6/2/1:3
8840-40# enable config equip channel so-1/6/2/1:3
8840-40(config-ch [so-1/6/2/1:3]) # vt-options 6/4 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # vt-options 7/1 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # vt-options 7/2 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # vt-options 7/3 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 1/1 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 1/2 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 1/3 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 1/4 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 2/1 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 2/2 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 2/3 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 2/4 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 3/1 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 3/2 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 3/3 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 3/4 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 4/1 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 4/2 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 4/3 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 4/4 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 5/1 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 5/2 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 5/3 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 5/4 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 6/1 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 6/2 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 6/3 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 6/4 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 7/1 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 7/2 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 7/3 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # ds1-options 7/4 admin enable
8840-40(config-ch [so-1/6/2/1:3]) # exit
8840-40# enable config equip port so-1/6/2/2 sonet-options channel sts1 1
8840-40# enable config equip channel so-1/6/2/2:1
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 1/1 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 1/2 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 1/3 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 1/4 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 2/1 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 2/2 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 2/3 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 2/4 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 3/1 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 3/2 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 3/3 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 3/4 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 4/1 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 4/2 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 4/3 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 4/4 admin enable
8840-40(config-ch [so-1/6/2/2:1]) # vt-options 5/1 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # vt-options 5/2 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # vt-options 5/3 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # vt-options 5/4 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # vt-options 6/1 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # vt-options 6/2 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # vt-options 6/3 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # vt-options 6/4 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # vt-options 7/1 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # vt-options 7/2 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # vt-options 7/3 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # vt-options 7/4 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 1/1 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 1/2 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 1/3 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 1/4 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 2/1 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 2/2 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 2/3 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 2/4 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 3/1 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 3/2 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 3/3 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 3/4 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 4/1 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 4/2 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 4/3 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 4/4 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 5/1 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 5/2 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 5/3 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 5/4 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 6/1 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 6/2 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 6/3 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 6/4 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 7/1 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 7/2 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 7/3 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # ds1-options 7/4 admin enable
8840-40 (config-ch [so-1/6/2/2:1]) # exit
8840-40# enable config equip port so-1/6/2/2 sonet-options channel stsl 2
8840-40# enable config equip channel so-1/6/2/2:2
8840-40 (config-ch [so-1/6/2/2:2]) # vt-options 1/1 admin enable
8840-40 (config-ch [so-1/6/2/2:2]) # vt-options 1/2 admin enable
8840-40 (config-ch [so-1/6/2/2:2]) # vt-options 1/3 admin enable
8840-40 (config-ch [so-1/6/2/2:2]) # vt-options 1/4 admin enable
8840-40 (config-ch [so-1/6/2/2:2]) # vt-options 2/1 admin enable
8840-40 (config-ch [so-1/6/2/2:2]) # vt-options 2/2 admin enable
8840-40 (config-ch [so-1/6/2/2:2]) # vt-options 2/3 admin enable
8840-40 (config-ch [so-1/6/2/2:2]) # vt-options 2/4 admin enable
8840-40 (config-ch [so-1/6/2/2:2]) # vt-options 3/1 admin enable
8840-40 (config-ch [so-1/6/2/2:2]) # vt-options 3/2 admin enable
8840-40 (config-ch [so-1/6/2/2:2]) # vt-options 3/3 admin enable
8840-40(config-ch [so-1/6/2/2:2])# vt-options 3/4 admin enable
8840-40(config-ch [so-1/6/2/2:2])# vt-options 4/1 admin enable
8840-40(config-ch [so-1/6/2/2:2])# vt-options 4/2 admin enable
8840-40(config-ch [so-1/6/2/2:2])# vt-options 4/3 admin enable
8840-40(config-ch [so-1/6/2/2:2])# vt-options 4/4 admin enable
8840-40(config-ch [so-1/6/2/2:2])# vt-options 5/1 admin enable
8840-40(config-ch [so-1/6/2/2:2])# vt-options 5/2 admin enable
8840-40(config-ch [so-1/6/2/2:2])# vt-options 5/3 admin enable
8840-40(config-ch [so-1/6/2/2:2])# vt-options 5/4 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 1/1 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 1/2 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 1/3 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 1/4 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 2/1 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 2/2 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 2/3 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 2/4 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 3/1 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 3/2 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 3/3 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 3/4 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 4/1 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 4/2 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 4/3 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 4/4 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 5/1 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 5/2 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 5/3 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 5/4 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 6/1 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 6/2 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 6/3 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 6/4 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 7/1 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 7/2 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 7/3 admin enable
8840-40(config-ch [so-1/6/2/2:2])# ds1-options 7/4 admin enable
8840-40(config-ch [so-1/6/2/2:2])# exit
8840-40# enable config equip port so-1/6/2/2 sonet-options channel stsl 3
8840-40(config-ch [so-1/6/2/2:3])# vt-options 1/1 admin enable
8840-40(config-ch [so-1/6/2/2:3])# vt-options 1/2 admin enable
8840-40(config-ch [so-1/6/2/2:3])# vt-options 1/3 admin enable
8840-40(config-ch [so-1/6/2/2:3])# vt-options 1/4 admin enable
8840-40(config-ch [so-1/6/2/2:3])# vt-options 2/1 admin enable
vt options 2/2 admin enable
vt options 2/3 admin enable
vt options 2/4 admin enable
vt options 3/1 admin enable
vt options 3/2 admin enable
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dsl options 6/1 admin enable
dsl options 6/2 admin enable
dsl options 6/3 admin enable
dsl options 6/4 admin enable
dsl options 7/1 admin enable
dsl options 7/2 admin enable
dsl options 7/3 admin enable
dsl options 7/4 admin enable
exit
enable config equip port so-1/6/3/1 sonet options channel stsl 1
8840-40# enable config equip channel so-1/6/3/1:1
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 1/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 1/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 1/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 1/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 2/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 2/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 2/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 2/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 3/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 3/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 3/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 3/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 4/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 4/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 4/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 4/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 5/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 5/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 5/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 5/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 6/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 6/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 6/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 6/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 7/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 7/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 7/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# vt-options 7/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 1/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 1/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 1/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 1/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 2/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 2/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 2/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 2/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 3/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 3/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 3/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 3/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 4/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 4/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 4/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 4/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 5/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 5/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 5/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 5/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 6/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 6/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 6/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 6/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:1])# dsl-options 7/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:1] )# ds1-options 7/2_ admin enable
8840-40(cfg-ch [so-1/6/3/1:1] )# ds1-options 7/3_ admin enable
8840-40(cfg-ch [so-1/6/3/1:1] )# ds1-options 7/4_ admin enable
8840-40(cfg-ch [so-1/6/3/1:1] )# exit
8840-40# enable config equip port so-1/6/3/1_ sonet-options channel sts1 2
8840-40# enable config equip channel so-1/6/3/1:2
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 1/1_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 1/2_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 1/3_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 1/4_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 2/1_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 2/2_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 2/3_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 2/4_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 3/1_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 3/2_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 3/3_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 3/4_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 4/1_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 4/2_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 4/3_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 4/4_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 5/1_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 5/2_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 5/3_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 5/4_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 6/1_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 6/2_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 6/3_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 6/4_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 7/1_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 7/2_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 7/3_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )#vt-options 7/4_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 1/1_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 1/2_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 1/3_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 1/4_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 2/1_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 2/2_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 2/3_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 2/4_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 3/1_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 3/2_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 3/3_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 3/4_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 4/1_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 4/2_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 4/3_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 4/4_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 5/1_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 5/2_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 5/3_ admin enable
8840-40(cfg-ch [so-1/6/3/1:2] )# ds1-options 5/4_ admin enable

8840-40(config-ch [so-1/6/3/1:2])# ds1-options 6/1 admin enable
8840-40(config-ch [so-1/6/3/1:2])# ds1-options 6/2 admin enable
8840-40(config-ch [so-1/6/3/1:2])# ds1-options 6/3 admin enable
8840-40(config-ch [so-1/6/3/1:2])# ds1-options 6/4 admin enable
8840-40(config-ch [so-1/6/3/1:2])# ds1-options 7/1 admin enable
8840-40(config-ch [so-1/6/3/1:2])# ds1-options 7/2 admin enable
8840-40(config-ch [so-1/6/3/1:2])# ds1-options 7/3 admin enable
8840-40(config-ch [so-1/6/3/1:2])# ds1-options 7/4 admin enable
8840-40(config-ch [so-1/6/3/1:2])# exit
8840-40# enable config equip port so-1/6/3/1 sonet-options channel stsl 3
8840-40# enable config equip port so-1/6/3/1 sonet-options channel stsl 3
8840-40(cfg-ch [so-1/6/3/1:3])# dsl-options 4/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:3])# dsl-options 4/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:3])# dsl-options 4/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:3])# dsl-options 5/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:3])# dsl-options 5/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:3])# dsl-options 5/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:3])# dsl-options 5/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:3])# dsl-options 6/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:3])# dsl-options 6/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:3])# dsl-options 6/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:3])# dsl-options 6/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:3])# dsl-options 7/1 admin enable
8840-40(cfg-ch [so-1/6/3/1:3])# dsl-options 7/2 admin enable
8840-40(cfg-ch [so-1/6/3/1:3])# dsl-options 7/3 admin enable
8840-40(cfg-ch [so-1/6/3/1:3])# dsl-options 7/4 admin enable
8840-40(cfg-ch [so-1/6/3/1:3])# exit
8840-40# enable config equip port so-1/6/3/2 sonet-options channel
8840-40# enable config equip port so-1/6/3/2
8840-40# enable config equip channel so-1/6/3/2:1
8840-40# enable config equip channel so-1/6/3/2:1
8840-40# enable config equip channel so-1/6/3/2:1
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 2/4 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 3/1 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 3/2 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 3/3 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 3/4 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 4/1 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 4/2 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 4/3 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 4/4 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 5/1 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 5/2 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 5/3 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 5/4 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 6/1 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 6/2 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 6/3 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 6/4 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 7/1 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 7/2 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 7/3 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # ds1-options 7/4 admin enable
8840-40 (cfg-ch [so-1/6/3/2:1]) # exit
8840-40 # enable config equip port so-1/6/3/2 sonet-options channel stsl 2
8840-40 # enable config equip channel so-1/6/3/2:2
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 1/1 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 1/2 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 1/3 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 1/4 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 2/1 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 2/2 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 2/3 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 2/4 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 3/1 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 3/2 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 3/3 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 3/4 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 4/1 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 4/2 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 4/3 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 4/4 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 5/1 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 5/2 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 5/3 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 5/4 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 6/1 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 6/2 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 6/3 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 6/4 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 7/1 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 7/2 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 7/3 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # vt-options 7/4 admin enable
8840-40 (cfg-ch [so-1/6/3/2:2]) # ds1-options 1/1 admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 1/2_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 1/3_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 1/4_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 2/1_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 2/2_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 2/3_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 2/4_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 3/1_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 3/2_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 3/3_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 3/4_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 4/1_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 4/2_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 4/3_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 4/4_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 5/1_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 5/2_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 5/3_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 5/4_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 6/1_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 6/2_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 6/3_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 6/4_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 7/1_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 7/2_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 7/3_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# ds1-options 7/4_ admin enable
8840-40(cfg-ch [so-1/6/3/2:2] )# exit
8840-40# enable config equip port so-1/6/3/2_ sonet-options channel sts1 3
8840-40# enable config equip channel so-1/6/3/2:3
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 1/1_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 1/2_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 1/3_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 1/4_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 2/1_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 2/2_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 2/3_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 2/4_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 3/1_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 3/2_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 3/3_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 3/4_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 4/1_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 4/2_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 4/3_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 4/4_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 5/1_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 5/2_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 5/3_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 5/4_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 6/1_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 6/2_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 6/3_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 6/4_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 7/1_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 7/2_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 7/3_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# vt-options 7/4_ admin enable
8840-40(cfg-ch [so-1/6/3/2:3] )# exit
8840-40# enable config equip port so-1/6/4/1_ sonet-options channel
8840-40# enable config equip channel so-1/6/4/1:1
8840-40# exit
8840-40(cfg-ch [so-1/6/4/1:1]) # vt-options 5/2 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # vt-options 5/3 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # vt-options 5/4 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # vt-options 6/1 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # vt-options 6/2 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # vt-options 6/3 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # vt-options 6/4 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # vt-options 7/1 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # vt-options 7/2 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # vt-options 7/3 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # vt-options 7/4 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 1/1 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 1/2 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 1/3 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 1/4 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 2/1 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 2/2 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 2/3 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 2/4 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 3/1 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 3/2 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 3/3 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 3/4 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 4/1 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 4/2 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 4/3 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 4/4 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 5/1 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 5/2 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 5/3 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 5/4 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 6/1 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 6/2 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 6/3 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 6/4 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 7/1 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 7/2 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 7/3 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # ds1-options 7/4 admin enable
8840-40(cfg-ch [so-1/6/4/1:1]) # exit
8840-40# enable config equip port so-1/6/4/1 sonet-options channel stsl 2
8840-40# enable config equip channel so-1/6/4/1:2
8840-40(cfg-ch [so-1/6/4/1:2]) # vt-options 1/1 admin enable
8840-40(cfg-ch [so-1/6/4/1:2]) # vt-options 1/2 admin enable
8840-40(cfg-ch [so-1/6/4/1:2]) # vt-options 1/3 admin enable
8840-40(cfg-ch [so-1/6/4/1:2]) # vt-options 1/4 admin enable
8840-40(cfg-ch [so-1/6/4/1:2]) # vt-options 2/1 admin enable
8840-40(cfg-ch [so-1/6/4/1:2]) # vt-options 2/2 admin enable
8840-40(cfg-ch [so-1/6/4/1:2]) # vt-options 2/3 admin enable
8840-40(cfg-ch [so-1/6/4/1:2]) # vt-options 2/4 admin enable
8840-40(cfg-ch [so-1/6/4/1:2]) # vt-options 3/1 admin enable
8840-40(cfg-ch [so-1/6/4/1:2]) # vt-options 3/2 admin enable
8840-40(cfg-ch [so-1/6/4/1:2]) # vt-options 3/3 admin enable
8840-40(cfg-ch [so-1/6/4/1:2]) # vt-options 3/4 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 3/4 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 4/1 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 4/2 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 4/3 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 4/4 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 5/1 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 5/2 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 5/3 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 5/4 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 6/1 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 6/2 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 6/3 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 6/4 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 7/1 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 7/2 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 7/3 admin enable
8840-40(config-ch [so-1/6/4/1:2])# vt-options 7/4 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 1/1 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 1/2 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 1/3 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 1/4 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 2/1 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 2/2 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 2/3 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 2/4 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 3/1 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 3/2 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 3/3 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 3/4 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 4/1 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 4/2 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 4/3 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 4/4 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 5/1 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 5/2 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 5/3 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 5/4 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 6/1 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 6/2 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 6/3 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 6/4 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 7/1 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 7/2 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 7/3 admin enable
8840-40(config-ch [so-1/6/4/1:2])# ds1-options 7/4 admin enable
8840-40(config-ch [so-1/6/4/1:2])# exit
8840-40# enable config equip port so-1/6/4/1 sonet-options channel stsl 3
8840-40(config-ch [so-1/6/4/1:3])# vt-options 1/1 admin enable
8840-40(config-ch [so-1/6/4/1:3])# vt-options 1/2 admin enable
8840-40(config-ch [so-1/6/4/1:3])# vt-options 1/3 admin enable
8840-40(config-ch [so-1/6/4/1:3])# vt-options 1/4 admin enable
8840-40(config-ch [so-1/6/4/1:3])# vt-options 2/1 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 2/2 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 2/3 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 2/4 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 3/1 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 3/2 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 3/3 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 3/4 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 4/1 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 4/2 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 4/3 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 4/4 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 5/1 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 5/2 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 5/3 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 5/4 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 6/1 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 6/2 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 6/3 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 6/4 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 7/1 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 7/2 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 7/3 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # vt-options 7/4 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 1/1 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 1/2 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 1/3 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 1/4 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 2/1 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 2/2 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 2/3 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 2/4 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 3/1 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 3/2 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 3/3 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 3/4 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 4/1 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 4/2 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 4/3 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 4/4 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 5/1 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 5/2 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 5/3 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 5/4 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 6/1 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 6/2 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 6/3 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 6/4 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 7/1 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 7/2 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 7/3 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # ds1-options 7/4 admin enable
8840-40 (cfg-ch [so-1/6/4/1:3]) # exit
8840-40# enable config equip port so-1/6/4/2 sonet-options channel stsl 1
8840-40# enable config equip channel so-1/6/4/2:1
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 1/1 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 1/2 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 1/3 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 1/4 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 2/1 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 2/2 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 2/3 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 2/4 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 3/1 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 3/2 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 3/3 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 3/4 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 4/1 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 4/2 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 4/3 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 4/4 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 5/1 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 5/2 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 5/3 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 5/4 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 6/1 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 6/2 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 6/3 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 6/4 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 7/1 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 7/2 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 7/3 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# vt-options 7/4 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 1/1 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 1/2 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 1/3 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 1/4 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 2/1 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 2/2 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 2/3 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 2/4 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 3/1 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 3/2 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 3/3 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 3/4 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 4/1 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 4/2 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 4/3 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 4/4 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 5/1 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 5/2 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 5/3 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 5/4 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 6/1 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 6/2 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 6/3 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 6/4 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 7/1 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 7/2 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 7/3 admin enable
8840-40(cfg-ch [so-1/6/4/2:1])# ds1-options 7/4 admin enable
8840-40(cfg-ch [so-1/6/4/2:1] )# ds1-options 7/2_ admin enable
8840-40(cfg-ch [so-1/6/4/2:1] )# ds1-options 7/3_ admin enable
8840-40(cfg-ch [so-1/6/4/2:1] )# ds1-options 7/4_ admin enable
8840-40(cfg-ch [so-1/6/4/2:1] )# exit
8840-40# enable config equip port so-1/6/4/2_ sonet-options channel
     sts1 2
8840-40# enable config equip channel so-1/6/4/2:2
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 1/1_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 1/2_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 1/3_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 1/4_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 2/1_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 2/2_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 2/3_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 2/4_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 3/1_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 3/2_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 3/3_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 4/1_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 4/2_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 4/3_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 5/1_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 5/2_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 5/3_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 6/1_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 6/2_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 6/3_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 7/1_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 7/2_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 7/3_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# vt-options 7/4_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 1/1_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 1/2_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 1/3_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 1/4_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 2/1_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 2/2_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 2/3_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 2/4_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 3/1_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 3/2_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 3/3_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 3/4_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 4/1_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 4/2_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 4/3_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 4/4_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 5/1_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 5/2_ admin enable
8840-40(cfg-ch [so-1/6/4/2:2] )# ds1-options 5/3_ admin enable
8840-40# ds1-options 5/4 _ admin enable
8840-40# ds1-options 6/1 _ admin enable
8840-40# ds1-options 6/2 _ admin enable
8840-40# ds1-options 6/3 _ admin enable
8840-40# ds1-options 6/4 _ admin enable
8840-40# ds1-options 7/1 _ admin enable
8840-40# ds1-options 7/2 _ admin enable
8840-40# ds1-options 7/3 _ admin enable
8840-40# ds1-options 7/4 _ admin enable
8840-40# exit
8840-40# enable config equip port so-1/6/4/2_ sonet-options channel stsl_3
8840-40# enable config equip channel so-1/6/4/2:3
8840-40# vt-options 1/1 _ admin enable
8840-40# vt-options 1/2 _ admin enable
8840-40# vt-options 1/3 _ admin enable
8840-40# vt-options 1/4 _ admin enable
8840-40# vt-options 2/1 _ admin enable
8840-40# vt-options 2/2 _ admin enable
8840-40# vt-options 2/3 _ admin enable
8840-40# vt-options 2/4 _ admin enable
8840-40# vt-options 3/1 _ admin enable
8840-40# vt-options 3/2 _ admin enable
8840-40# vt-options 3/3 _ admin enable
8840-40# vt-options 3/4 _ admin enable
8840-40# vt-options 4/1 _ admin enable
8840-40# vt-options 4/2 _ admin enable
8840-40# vt-options 4/3 _ admin enable
8840-40# vt-options 4/4 _ admin enable
8840-40# vt-options 5/1 _ admin enable
8840-40# vt-options 5/2 _ admin enable
8840-40# vt-options 5/3 _ admin enable
8840-40# vt-options 5/4 _ admin enable
8840-40# vt-options 6/1 _ admin enable
8840-40# vt-options 6/2 _ admin enable
8840-40# vt-options 6/3 _ admin enable
8840-40# vt-options 6/4 _ admin enable
8840-40# vt-options 7/1 _ admin enable
8840-40# vt-options 7/2 _ admin enable
8840-40# vt-options 7/3 _ admin enable
8840-40# vt-options 7/4 _ admin enable
8840-40# ds1-options 1/1 _ admin enable
8840-40# ds1-options 1/2 _ admin enable
8840-40# ds1-options 1/3 _ admin enable
8840-40# ds1-options 1/4 _ admin enable
8840-40# ds1-options 2/1 _ admin enable
8840-40# ds1-options 2/2 _ admin enable
8840-40# ds1-options 2/3 _ admin enable
8840-40# ds1-options 2/4 _ admin enable
8840-40# ds1-options 3/1 _ admin enable
8840-40# ds1-options 3/2 _ admin enable
8840-40# ds1-options 3/3 _ admin enable
8840-40# ds1-options 3/4 _ admin enable
8840-40# ds1-options 4/1 _ admin enable
8840-40# enable config equip port so-1/7/1/1_ sonet-options channel
sts1 1

8840-40# enable config channel so-1/7/1/1:1
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 1/1_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 1/2_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 1/3_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 1/4_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 2/1_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 2/2_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 2/3_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 2/4_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 3/1_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 3/2_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 3/3_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 3/4_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 4/1_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 4/2_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 4/3_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 4/4_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 5/1_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 5/2_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 5/3_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 5/4_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 6/1_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 6/2_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 6/3_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 6/4_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 7/1_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 7/2_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 7/3_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # vt-options 7/4_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # dsl-options 1/1_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # dsl-options 1/2_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # dsl-options 1/3_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # dsl-options 1/4_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # dsl-options 2/1_ admin enable
8840-40 (cfg-ch [so-1/7/1/1:1]) # dsl-options 2/2_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 2/3_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 2/4_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 3/1_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 3/2_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 3/3_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 3/4_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 4/1_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 4/2_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 4/3_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 4/4_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 5/1_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 5/2_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 5/3_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 5/4_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 6/1_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 6/2_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 6/3_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 6/4_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 7/1_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 7/2_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 7/3_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# ds1-options 7/4_ admin enable
8840-40(cfg-ch [so-1/7/1/1:1] )# exit
8840-40# enable config equip port so-1/7/1/1_ sonet-options channel stsl 2
8840-40# enable config equip channel so-1/7/1/1:2
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 1/1_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 1/2_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 1/3_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 1/4_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 2/1_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 2/2_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 2/3_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 2/4_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 3/1_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 3/2_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 3/3_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 3/4_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 4/1_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 4/2_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 4/3_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 4/4_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 5/1_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 5/2_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 5/3_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 5/4_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 6/1_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 6/2_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 6/3_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 6/4_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 7/1_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 7/2_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 7/3_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# vt-options 7/4_ admin enable
8840-40(cfg-ch [so-1/7/1/1:2] )# exit
8840-40 (cfg-ch [so-1/7/1/1:2]) # vt-options 7/4 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 1/1 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 1/2 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 1/3 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 1/4 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 2/1 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 2/2 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 2/3 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 2/4 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 3/1 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 3/2 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 3/3 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 3/4 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 4/1 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 4/2 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 4/3 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 4/4 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 5/1 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 5/2 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 5/3 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 5/4 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 6/1 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 6/2 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 6/3 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 6/4 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 7/1 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 7/2 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 7/3 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # ds1-options 7/4 admin enable
8840-40 (cfg-ch [so-1/7/1/1:2]) # exit

8840-40 # enable config equip port so-1/7/1/1 _ sonet-options channel stsl 3

8840-40 # enable config equip channel so-1/7/1/1:3
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 1/1 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 1/2 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 1/3 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 1/4 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 2/1 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 2/2 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 2/3 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 2/4 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 3/1 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 3/2 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 3/3 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 3/4 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 4/1 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 4/2 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 4/3 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 4/4 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 5/1 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 5/2 admin enable
8840-40 (cfg-ch [so-1/7/1/1:3]) # vt-options 5/3 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # vt-options 5/4 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # vt-options 6/1 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # vt-options 6/2 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # vt-options 6/3 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # vt-options 6/4 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # vt-options 7/1 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # vt-options 7/2 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # vt-options 7/3 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # vt-options 7/4 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 1/1 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 1/2 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 1/3 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 1/4 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 2/1 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 2/2 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 2/3 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 2/4 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 3/1 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 3/2 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 3/3 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 3/4 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 4/1 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 4/2 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 4/3 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 4/4 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 5/1 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 5/2 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 5/3 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 5/4 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 6/1 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 6/2 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 6/3 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 6/4 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 7/1 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 7/2 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 7/3 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # dsl-options 7/4 admin enable
8840-40 (cfg-ch [so-1/7/1:1:3]) # exit
8840-40 # enable config equip port so-1/7/1/2 sonet-options channel stsl 1
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 1/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 1/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 1/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 1/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 2/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 2/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 2/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 2/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 3/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 3/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 3/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 3/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 4/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 4/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 4/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 4/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 5/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 5/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 5/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 5/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 6/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 6/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 6/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 6/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 7/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 7/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 7/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 7/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 4/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 4/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 4/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 4/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 5/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 5/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 5/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 5/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 6/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 6/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 6/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 6/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 7/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 7/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 7/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # vt-options 7/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 1/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 1/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 1/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 1/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 2/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 2/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 2/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 2/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 3/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 3/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 3/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 3/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 4/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 4/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 4/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 4/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 5/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 5/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 5/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 5/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 6/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 6/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 6/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 6/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 7/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 7/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 7/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # ds1-options 7/4 admin enable
8840-40 (cfg-ch [so-1/7/1/2:1]) # exit

8840-40 # enable config equip port so-1/7/1/2 sonet-options channel stsl 2
8840-40 # enable config equip channel so-1/7/1/2:2
8840-40 (cfg-ch [so-1/7/1/2:2]) # vt-options 1/1 admin enable
8840-40 (cfg-ch [so-1/7/1/2:2]) # vt-options 1/2 admin enable
8840-40 (cfg-ch [so-1/7/1/2:2]) # vt-options 1/3 admin enable
8840-40 (cfg-ch [so-1/7/1/2:2]) # vt-options 1/4 admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 2/1_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 2/2_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 2/3_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 2/4_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 3/1_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 3/2_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 3/3_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 3/4_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 4/1_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 4/2_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 4/3_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 4/4_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 5/1_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 5/2_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 5/3_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 5/4_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 6/1_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 6/2_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 6/3_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 6/4_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 7/1_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 7/2_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 7/3_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# vt-options 7/4_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 1/1_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 1/2_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 1/3_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 1/4_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 2/1_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 2/2_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 2/3_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 2/4_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 3/1_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 3/2_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 3/3_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 3/4_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 4/1_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 4/2_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 4/3_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 4/4_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 5/1_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 5/2_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 5/3_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 5/4_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 6/1_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 6/2_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 6/3_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 6/4_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 7/1_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 7/2_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 7/3_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# dsl-options 7/4_admin enable
8840-40(cfg-ch [so-1/7/1/2:2])# exit
8840-40# enable config equip port so-1/7/1/2_ sonet-options channel sts1 3
8840-40# enable config equip channel so-1/7/1/2:3
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 1/1_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 1/2_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 1/3_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 1/4_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 2/1_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 2/2_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 2/3_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 2/4_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 3/1_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 3/2_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 3/3_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 3/4_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 4/1_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 4/2_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 4/3_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 4/4_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 5/1_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 5/2_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 5/3_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 5/4_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 6/1_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 6/2_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 6/3_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 6/4_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 7/1_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 7/2_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 7/3_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# vt-options 7/4_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-option 1/1_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 1/2_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 1/3_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 1/4_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 2/1_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 2/2_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 2/3_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 2/4_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 3/1_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 3/2_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 3/3_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 3/4_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 4/1_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 4/2_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 4/3_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 4/4_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 5/1_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 5/2_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 5/3_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 5/4_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 6/1_ admin enable
8840-40(cfg-ch [so-1/7/1/2:3] )# dsl-options 6/2_ admin enable
8840-40# enable config equip port so-1/7/2/1_ sonet-options channel 
sts1 1
8840-40# enable config equip channel so-1/7/2/1:1
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 1/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 1/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 1/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 1/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 2/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 2/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 2/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 2/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 3/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 3/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 3/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 3/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 4/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 4/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 4/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 4/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 5/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 5/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 5/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 5/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 6/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 6/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 6/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 6/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 7/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 7/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 7/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# vt-options 7/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# dsl-options 1/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# dsl-options 1/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# dsl-options 1/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# dsl-options 1/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# dsl-options 2/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# dsl-options 2/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# dsl-options 2/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# dsl-options 2/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# dsl-options 3/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# dsl-options 3/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# dsl-options 3/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# dsl-options 3/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# dsl-options 4/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:1] )# dsl-options 4/2_ admin enable
8840-40# enable config equip port so-1/7/2/1:_ sonet-options channel
sts 2

8840-40# enable config equip channel so-1/7/2/1:2
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 1/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 1/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 1/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 1/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 2/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 2/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 2/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 2/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 3/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 3/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 3/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 3/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 4/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 4/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 4/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 4/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 5/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 5/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 5/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 5/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 6/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 6/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 6/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 6/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 7/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 7/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 7/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# vt-options 7/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 1/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 1/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 1/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 1/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 2/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 2/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 2/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 2/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 3/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 3/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 3/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 3/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 4/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 4/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 4/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 4/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 5/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 5/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 5/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 5/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 6/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 6/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 6/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 6/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 7/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 7/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 7/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 7/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 2/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 2/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 2/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 3/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 3/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 3/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 3/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 4/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 4/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 4/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 4/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 5/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 5/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 5/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 5/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 6/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 6/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 6/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 6/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 7/1_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 7/2_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 7/3_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# ds1-options 7/4_ admin enable
8840-40(cfg-ch [so-1/7/2/1:2] )# exit