TeamQuest
Predictive Analytics & Advanced Reporting
Jeff Schultz – Sales Engineer
Capacity Management Challenges

- Hours and hours sifting through reports / spreadsheets.
- Where are those under / over utilized resources, on premise or in cloud?
- No health and risk indicators.
- How do I identify and avoid risk?
- Is the workload profile optimized?
- No reliable or consistent data.
Capacity Management Requirements

- Application and Service Visibility
- Out-of-the-Box Analysis & Intelligent Reporting
- Advance Analytics for “What If” Analysis
- Automated Reporting
IT Maturity Assessment

**Level 1: Chaotic**
- Ad hoc
- Notifications via user calls
- No centralized help desk
- No infrastructure management

**Level 2: Reactive**
- Component view
- Firefighting
- Alert & event monitoring
- Formalized incident reporting
- Siloed responsibility for technology

**Level 3: Proactive**
- Workload view
- Predict, prevent performance problems
- Trending
- Availability management
- Standardized toolset across technologies

**Level 4: Service**
- Service view
- Monitor & report on services
- Service level agreements
- Scenario-based capacity planning
- Influence usage through chargeback

**Level 5: Value**
- Business process view
- Link IT services to business processes
- Report in business terms
- Measure process efficiency & effectiveness
- Weigh costs against benefits & risks
- Continuous service improvement
The State of Enterprise IT Maturity in 2016

- Conducting business in chaos
- Experiencing cloud outages
- Lack of mature processes and understanding of health and risk
# IT Service Optimization Self-Assessment

On a scale from 1-5, where would you rate your organization’s current IT optimization processes?

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3%</td>
<td>1 (least mature): Any efforts to improve service quality is usually triggered by incidents brought to our attention by users or customers complaining</td>
</tr>
<tr>
<td>13%</td>
<td>2: Alerts are deployed as specified thresholds are crossed. We are then able to address incidents quickly and consistently</td>
</tr>
<tr>
<td>31%</td>
<td>3: My organization uses past and incoming data to uncover incident patterns</td>
</tr>
<tr>
<td>36%</td>
<td>4: We bolster decision making by asking hypothetical questions and conducting various “what-if” scenarios</td>
</tr>
<tr>
<td>17%</td>
<td>5 (most mature): My organization has the ability to optimize operations via proactive, automated actions. Every solution is embedded with a profound understanding of business goals and their relationship to its online services</td>
</tr>
</tbody>
</table>

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IT Service Optimization Maturity Assessment Scores

- Chaotic: 56%
- Reactive: 16%
- Proactive: 14%
- Value: 13%
- Service: 1%
IT departments deal with an average of 6 IT fires each week.

To mitigate, each IT fire takes...

3 hours & 16 minutes

8 staff members
Service or Application Watchlist

Vityl Adviser Service Watchlists

Status
- Unhealthy Services
- At Risk Services

Messages

Jeffs
We just started using Vityl Adviser. Now we will be able to react well before we have current risk. My job is going to be fun again!

Jeffs
Feb 9
Cwv19&20 are virtual systems. The Loans service has been steadily growing. I asked the VMware admin team to add more vCPUs this weekend.

johnm
Feb 9
I see that many of the systems in the Loans service have remediation plans in place but not cvw19&20. I asked Jeff to look at these.

johnm
Feb 9
I see that the Loans service is a risk currently. I am investigating this.

Service Watchlists

Name
- Core Banking Services
- Personal Banking
- Shopping Cart
Shopping Cart Service – Health and Risk

Service Health

- AppSrv: Health History, Health 98
- DataSrv: Health History, Health 30
- WebSrv: Health History, Health 54
- AWS: Health History, Health 60

Service Risk

- AppSrv: Risk Prediction, Risk 100, Days To Risk 0
- DataSrv: Risk Prediction, Risk 67, Days To Risk 0
- WebSrv: Risk Prediction, Risk 49, Days To Risk 0
- AWS: Risk Prediction, Risk 2, Days To Risk 0
Shopping Cart Service – Health and Risk

**Service Health** section displays current and historical health scores for each service in the watchlist. Health is an indicator of service performance.

The **Health History** graph displays the health score over the past 30 days. The last point on the graph is the current health score.

- Healthy with score from 55 - 100
- Warning with score from 45-54
- Unhealthy with score from 0 - 44

**Health** is the lowest health score for any system in the watchlist.

For more information, see [Investigating Service Health and Risk](#).

**Service Risk** section displays predicted risk scores for each service in the watchlist. Risk is an indication of how services are predicted to perform.

The **Risk Prediction** graph displays the predicted risk score for the next 6 months. It is calculated based on the subsystem that has the soonest **Days To Risk**.

- Low risk with score from 0 - 45
- Warning with score 46 - 55
- High risk with score 56 - 100

**Risk** is the worst risk score for the system for the next 6 months.

**Days to Risk** is the minimum number of days until the worst system in the service is predicted to be at risk.

For more information, see [Investigating Service Health and Risk](#).
### Shopping Cart – DataSrv Tier

<table>
<thead>
<tr>
<th>System</th>
<th>Health History</th>
<th>Health</th>
<th>Risk Prediction</th>
<th>Risk</th>
<th>Days To Risk</th>
<th>Date of Risk</th>
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</thead>
<tbody>
<tr>
<td>salesclab1</td>
<td>~ ~ ~ ~ ~ ~ ~ ~</td>
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<td>Red</td>
<td>67</td>
<td>0</td>
<td>2016-07-11</td>
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<tr>
<td>salesclab2</td>
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<td>100</td>
<td>Gray</td>
<td>16</td>
<td>-</td>
<td>-</td>
</tr>
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<td>System</td>
<td>Health History</td>
<td>Health</td>
<td>Risk Prediction</td>
<td>Risk</td>
<td>Days To Risk</td>
<td>Date of Risk</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------</td>
<td>--------</td>
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<td>------</td>
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<tr>
<td>SALESCLIW6</td>
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<td>49</td>
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<td>30</td>
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<table>
<thead>
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<th>Risk</th>
<th>Days To Risk</th>
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<th>Risk</th>
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<table>
<thead>
<tr>
<th>System</th>
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<th>Risk</th>
<th>Days To Risk</th>
<th>Date of Risk</th>
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<td>2016-07-11</td>
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<tr>
<td>salesctax2</td>
<td></td>
<td>100</td>
<td>16</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
### System Health

<table>
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<th>System</th>
<th>Health History</th>
<th>Health</th>
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<tr>
<td>salesclinux2</td>
<td></td>
<td></td>
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<tr>
<td>SALESCLW5</td>
<td></td>
<td>54</td>
</tr>
<tr>
<td>SALESCLW7</td>
<td></td>
<td>72</td>
</tr>
<tr>
<td>salesclinux3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>salesclinux4</td>
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<td></td>
</tr>
<tr>
<td>AWSW2</td>
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<td>awsa14.teamquest.com</td>
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</table>

### System Risk

<table>
<thead>
<tr>
<th>System</th>
<th>Risk Prediction</th>
<th>Risk</th>
<th>Days To Risk</th>
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</thead>
<tbody>
<tr>
<td>salesclinux1</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>salesclinux2</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>SALESCLW5</td>
<td>49</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Messages**

- **Jeff** (Feb 9):
  - We just started using Vinyl Adviser. Now we will be able to react well before we have current risk. My job is going to be fun again!

- **Jeff** (Feb 9):
  - Okm18&20 are virtual systems. The Loans service has been steadily growing. I asked the VMware admin team to add more vCPUs this weekend.

- **John** (Feb 9):
  - I see that many of the systems in the Loans service have remediation plans in place but not for Okm18&20. I asked Jeff to look at these.

- **John** (Feb 9):
  - I see that the Loans service is a risk currently. I am investigating this.

- **PureShare Admin** (Jan 26):
  - My Message

Show More
Database Tier – Health Profile
Shopping Cart – Server Watch List

System Details:
- **System Health**
  - salesclubuntu1: 98
  - salesclx1: 30
  - SALESCLW6: 54
  - SALESCLW7: 72
  - salesclubuntu2: 98
  - salesclubuntu3: 98
  - salesclx1: 100
  - AWS1
  - awsali2.teamquest.com: 99
  - awsh2.teamquest.com: 70
  - awsali4.teamquest.com: 60

- **System Risk**
  - salesclubuntu1: 100, Days To Risk: 0
  - salesclx1: 70, Days To Risk: 0
  - SALESCLW6: 49, Days To Risk: 0

Messages:
- Jeffs
  - We just started using VxR Advisor. Now we will be able to react well before we have current risk. My job is going to be fun again!
- Jeffs
  - Chm13&20 are virtual systems. The Loans service has been steadily growing. I asked the VMware admin team to add more vCPUs this weekend.
- jhmm
  - I see that many of the systems in the Loans service have remediation plans in place but not chm13&20. I asked Jeff to look at these.
- jhmm
  - I see that the Loans service is a risk currently. I am investigating this.
- Puns/Share Admin
  - My Message
  - Jan 26
  - Show More
Web Tier – Health Profile

- CPU Health Trends
  - CPU Busy
    - % of CPU utilization over time
  - CPU Details
    - % of CPU utilization by type (user, system, idle)
- Services Impacted
  - WebSrv
  - Windows
- Overall Health Score
  - Graph showing overall health score over time
Web Tier – Risk Profile

Subsystem Risk Predictions

CPU Risk
- Risk Score

Disk I/O Risk
- Risk Score

Services Impacted
- WebSrv
- Windows

System Risk Predictions
- Overall
  - Risk Score

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Shopping Cart Application

Current Infrastructure:
- AWS Tier – 4 cloud instances
- Application Tier – 3 VMware VMs
- Database Tier – 2 AIX LPARs

Current load average – 100 Transactions per sec
# Shopping Cart - Infrastructure

<table>
<thead>
<tr>
<th>Physical System Name</th>
<th>System Type</th>
<th>System Model</th>
<th>Logical System Name</th>
<th>OS Type</th>
<th>System Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>clvm19.teamquest.com</td>
<td>VMWARE_SERIES</td>
<td>VMware ESXi 5.1.0 build-1612806</td>
<td></td>
<td>clvm19.teamquest.com-vmm</td>
<td></td>
</tr>
<tr>
<td>clvm19.teamquest.com</td>
<td>VMWARE_SERIES</td>
<td>Virtual Machine Monitor</td>
<td>cluser15</td>
<td>VMWARE_SERIES</td>
<td>Reservation = 0; Limit = 0; Shares = 1000</td>
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<tr>
<td>clvm19.teamquest.com</td>
<td>VMWARE_SERIES</td>
<td>SUSE Linux Enterprise 11 (32-bit)</td>
<td></td>
<td>cluser15</td>
<td>Reservation = 0; Limit = 0; Shares = 2000</td>
</tr>
<tr>
<td>clvm19.teamquest.com</td>
<td>VMWARE_SERIES</td>
<td>Ubuntu Linux (64-bit)</td>
<td>salesclubuntu1</td>
<td>LINUX_SERIES</td>
<td>Reservation = 0; Limit = 0; Shares = 2000</td>
</tr>
<tr>
<td>clvm19.teamquest.com</td>
<td>VMWARE_SERIES</td>
<td>Ubuntu Linux (64-bit)</td>
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<td>LINUX_SERIES</td>
<td>Reservation = 0; Limit = 0; Shares = 2000</td>
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<tr>
<td>clvm19.teamquest.com</td>
<td>VMWARE_SERIES</td>
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<td>cluser15</td>
<td>WINDOWS_SERIES</td>
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<td>ADX_SERIES</td>
<td>IBM,6406-71Y ADX 7.1</td>
<td></td>
<td></td>
<td>CPUs in Shared Pool = 8</td>
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<tr>
<td>8406-71Y-SN06FAC2A</td>
<td>ADX_SERIES</td>
<td>IBM,6406-71Y ADX 7.1</td>
<td>salesclak1</td>
<td>ADX_SERIES</td>
<td>Type = SHARED; Mode = UNCAPPED; Entitled Capacity = 0.2; Weight = 64</td>
</tr>
<tr>
<td>awsa4.teamquest.com</td>
<td>LINUX_SERIES</td>
<td>Amazon Linux AMI 2015.09 4.1.7-15.23.amzn1lx86_64</td>
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<td></td>
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</tr>
</tbody>
</table>
Multi-tier Workload – Shopping Cart Baseline

Change Systems per Tier

Select Workload

Shopping Cart

OK
Cancel
Help

Current Number
of Systems
in Tier
New Number
of Systems
in Tier

Tier
1 System: awsal4.teamquest.com
2 System: salesclubuntu1
3 System: salesclaiix1

4
4
3
3
2
2
## Shopping Cart – Baseline Calibration

<table>
<thead>
<tr>
<th>System Name</th>
<th>Workload</th>
<th>Measured Population</th>
<th>Modeled Response</th>
<th>Measured Throughput</th>
<th>Modeled Throughput</th>
<th>Active Resource</th>
<th>Measured AR%</th>
<th>Modeled AR%</th>
</tr>
</thead>
<tbody>
<tr>
<td>clvm19.teamquest.com</td>
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<td>3 CPU</td>
<td>3.1407</td>
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</table>

### Notes
- The table above displays the performance metrics for various system configurations and workloads.
- The metrics include measured and modeled response times, throughput, and active resources.
- The AR% values are calculated for comparison between measured and modeled performance.

---

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Business – Growth Scenario

- Baseline – 100 Transactions per minute
- Growth Scenario
  - 110 Transactions per minute
  - 4 Months growth to 540 transactions per minute
Baseline – 110 Transaction/Minute Growth

Risk Score

Series "Shopping Cart" Point: 540 TPM
Value 2.0631K

Legend:
- Shopping Cart
- clvm19.teamquest.com
- cluse15
- clubuntu6x64
- salescl1h4
Baseline – 110 Transaction/Minute Growth
Horizontal Capacity – AWS Tier

Change Systems per Tier

Select Workload: Shopping Cart

Current Number of Systems in Tier: 4
New Number of Systems in Tier: 4

Current Number of Systems in Tier: 4
New Number of Systems in Tier: 5

System 1: awsa4.teamquest.com
System 2: salesclubuntu1
System 3: salesclax1
System 4: salesclax1

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Horizontal Capacity - Results

Risk Score

.Queue * Service/Service

Series "Shopping Cart" Point "540 TPM" Value 1.120091

- Shopping Cart
- clm19.teamquest.com
- clusa15
- clubuntu3x34
- saleschv4
Vertical Capacity - Results

Change CPU Equipment

- Physical System Name: awsl4.teamquest.com
- Physical System Type: LINUX_SERIES
- CPU Equipment Name: Intel Xeon E7-2820 2.0GHz

Current Number of Chips: 1
Current Number of Cores per Chip: 8
Current Number of Threads per Core: 2
Relative Speed of Selected CPU to Current CPU: 1.0766

Change CPU Equipment

- Physical System Name: awsl4.teamquest.com
- Physical System Type: LINUX_SERIES
- CPU Equipment Name: Intel Xeon E7-2820 2.0GHz

Current Number of Chips: 1
Current Number of Cores per Chip: 8
Current Number of Threads per Core: 2
Relative Speed of Selected CPU to Current CPU: 1.0766

Number of Chips: 2
Number of Cores per Chip: 8
Number of Threads per Core: 2
Vertical Capacity - Results

Risk Score

- Shopping Cart
- cltm19.teamquest.com
- clsusa15
- clbrubu5x64
- salesclrv4
Vertical Capacity - Results

Components of Response Shopping Cart

- Baseline 100 TPM
- 210 TPM
- 320 TPM
- 430 TPM
- 540 TPM

Legend:
- All Other AR Queues Queue Delay
- All Other AR Queues Service
- 1 sdc(aawsal4.teamquest.com) Queue Delay
- 1 sdc(aawsal4.teamquest.com) Service
- sda(aawsal4.teamquest.com) Queue Delay
- sda(aawsal4.teamquest.com) Service
- sdb(aawsal4.teamquest.com) Queue Delay
- sdb(aawsal4.teamquest.com) Service
- 1 sdb(aawsal4.teamquest.com) Queue Delay
- 1 sdb(aawsal4.teamquest.com) Service
- sdc(aawsal4.teamquest.com) Queue Delay
- sdc(aawsal4.teamquest.com) Service
- 3 CPU(aawsal4.teamquest.com) Queue Delay
- 3 CPU(aawsal4.teamquest.com) Service
- LCPUSales1lx1(sales1lx1) Queue Delay
- LCPUSales1lx1(sales1lx1) Service
- LOPUSales1lx1(sales1lx1) Queue Delay
- LOPUSales1lx1(sales1lx1) Service
New Business – Growth Scenario

- Baseline – 100 Transactions per minute
- Growth Scenario
  - 175 Transactions per minute
  - 4 Months growth to 800 transactions per minute
New Growth – 175 Transaction/Minute
New Growth – 175 Transaction/Minute
New Growth - Horizontal Capacity
New Growth – 175 Transaction/Minute - Results

Risk Score

Series "Shopping Cart" Point "800 TPM"
Value: 2.162198

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New Growth – 175 Transaction/Minute - Results
Capacity Planning Summary

- Ability to have just the right mix of IT to deliver all your workloads
- Simplifying the IT experience, and remaining focused on business success
- Gaining greater IT agility

Make IT Better.