

Choosing Application Performance Management (APM) Tools

Peter Sevcik
NetForecast, Inc.
Charlottesville, Virginia
peter@netforecast.com

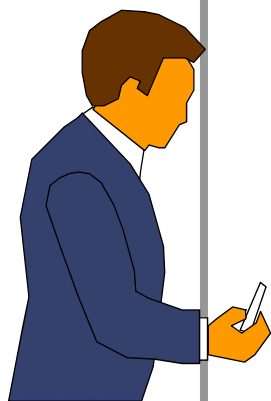


Apdex Alliance Webinar Series

We thank the Apdex Alliance sponsor companies for their generous support

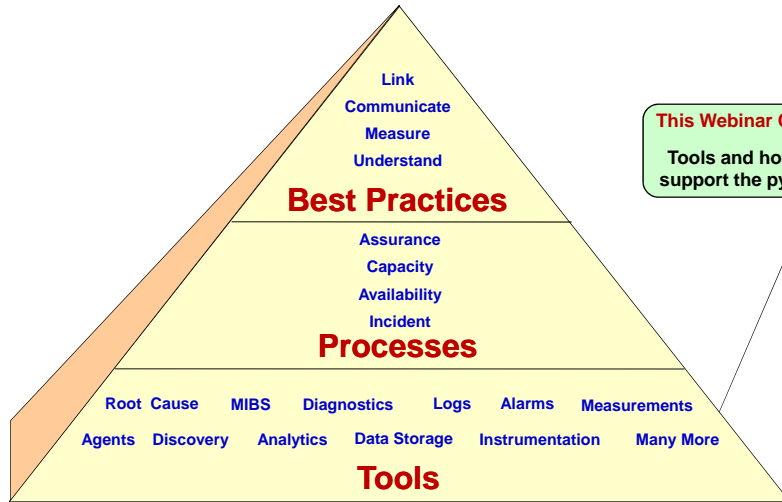


Outline



- **Framework Overview**
- **APM Tool Functional Areas**
- **Checklist Example**
- **Summary**

Performance Management Layers



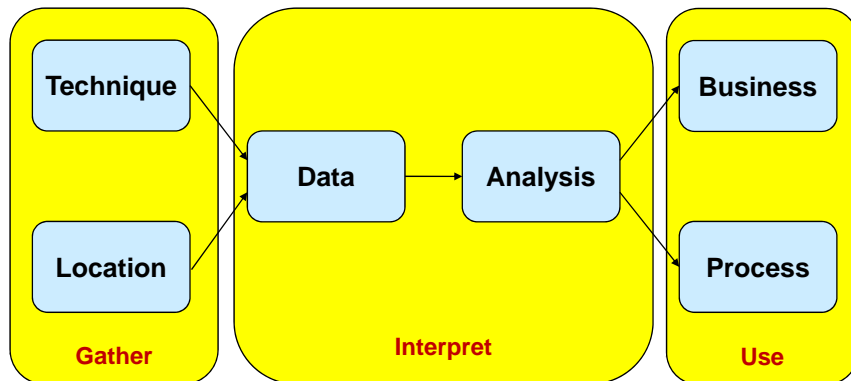
This Webinar Covers
Tools and how they support the pyramid

©2010, NetForecast, Inc., all rights reserved.

Source: NetForecast

Slide 3

Performance Management Tools Framework



Performance Management Stages

©2010, NetForecast, Inc., all rights reserved.

Slide 4

APM Tools Framework Areas



Technique

How performance is measured

Location

Where performance is measured

Data

What information is gathered

Analysis

Making the data useful

Process

How the tool supports operations

Business

How the tool integrates with the business

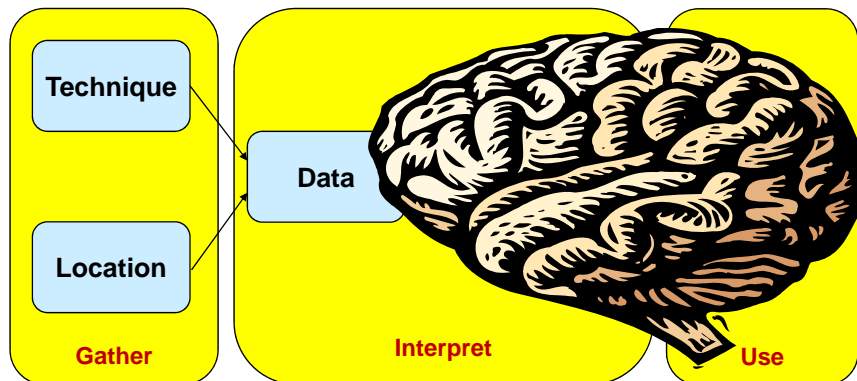
©2010, NetForecast, Inc., all rights reserved.

Slide 5

Half of an APM Tool



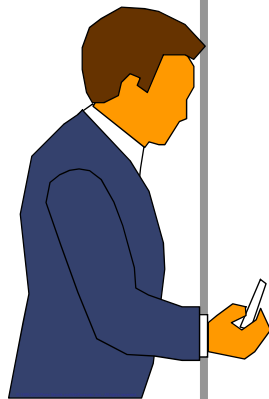
Tools that gather data but leave analysis, process and business work to the tool operator



©2010, NetForecast, Inc., all rights reserved.

Slide 6

Outline



- Framework Overview
- APM Tool Functional Areas
- Checklist Example
- Summary

©2010, NetForecast, Inc., all rights reserved.

Slide 7

Technique



- **How the performance is measured**
 - The goal of any measurement approach is high accuracy at low cost
 - There are two aspects to measuring performance, and the nature of these aspects influence both accuracy and cost
- **Touch**
 - Any measurement touches the system it measures which impacts the system in some way (uncertainty principle)
 - High touch may reduce accuracy by adversely affecting the system being measured
 - High touch requires more resources (raising the cost)
- **View**
 - Where the measurement is taken in the system determines what it can directly measure
 - Limited view requires multiple instrumentation points (higher cost) or extrapolation to broaden the results (lower accuracy)

©2010, NetForecast, Inc., all rights reserved.

Slide 8

Technique: Touch



■ Passive Touch

- **Observing events (packets, calls, queries) that are naturally occurring in the system**
 - Sniffer, passive probe
- **Receiving data from event counters that are built into the device**
 - SNMP, NetFlow, XML feed

■ Active Touch

- **Adding monitoring software to a device that tracks and reports activity**
 - Java code in browser, monitoring agent in server
- **Additional device in the system that simulates a user sending synthetic transactions**
 - Synthetic agent, transaction script



©2010, NetForecast, Inc., all rights reserved.

Slide 9

Technique: View



■ Internal View

- **Resource counters within a device**
 - Critical to the health of the device: memory utilization, packets processed, database queries processed

■ External View

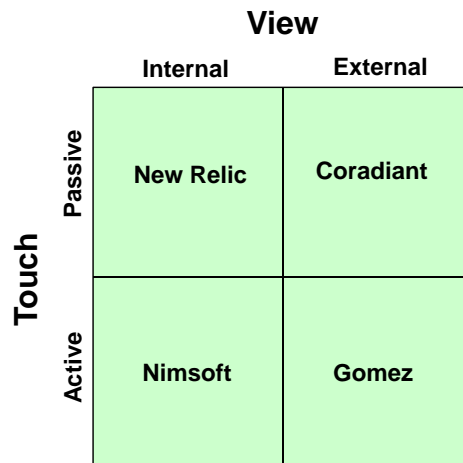
- **User events within a device**
 - User-level tagging of events as seen in a device
 - Traffic by application
- **Interpreting events up the protocol stack within a device**
 - TCP turns, HTTP get processed, page complete time



©2010, NetForecast, Inc., all rights reserved.

Slide 10

Technique: How the Tool Measures

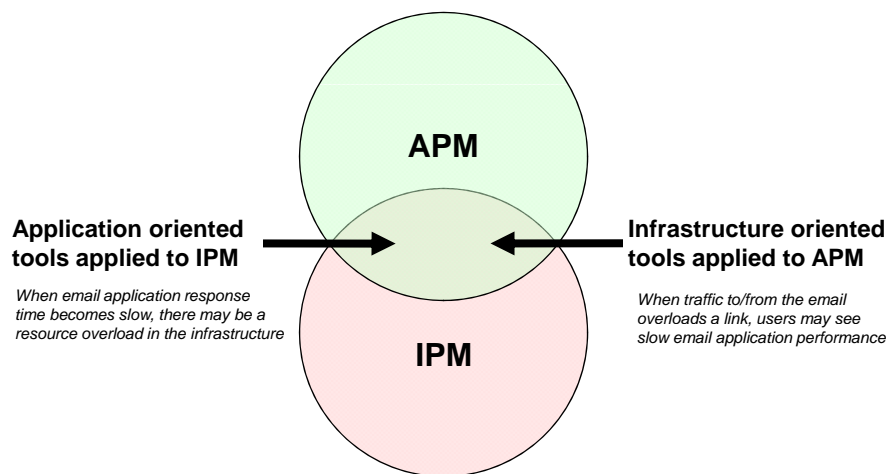


Vendors are here are examples

©2010, NetForecast, Inc., all rights reserved.

Slide 11

Application vs. Infrastructure Performance Management



©2010, NetForecast, Inc., all rights reserved.

Slide 12

Technique Summary



- **There is no uniformly "correct" answer**
 - Approaches in each of the 4 quadrants are useful and have value
- **Each enterprise has its unique conditions that will drive technique selection**
 - Often governed by external facts
 - How IT operates
 - Application platform
 - Who owns IT
 - Public or private user population
- **Don't be fooled into thinking that a good *IPM* tool is a good *APM* tool**

Location



- **Location = where the instrumentation is placed**
 - It governs where along the end-to-end path between user and content the data is gathered
- **Many enterprise scenarios limit the options**
 - End stations may not be under enterprise control
 - Even if controlled, there is a cost to installing & managing probes
 - Enterprises can't instrument much of a public service
 - Consumer assets are becoming a larger part of the delivery system but privacy and consumer non-cooperation make this difficult to monitor
 - Enterprises may not be able to install instrumentation on hosted servers
 - Cloud resources are a new instrumentation frontier

Location: Where the Tool Measures



- **End station**
 - Desktop, laptop, PDA, smartphone, tablet
- **Consumer LAN**
 - Access router, home wiring, home WiFi
- **Private WAN points**
 - Router, gateway, circuit, DNS
- **Public WAN points**
 - Access ISP, peering point, Internet backbone, CDN
- **Data center LAN**
 - Router, firewall, switch, load balancer, storage network
- **Cloud resource**
 - SaaS, HaaS Hardware-as-a-Service, PaaS Platform-as-a-Service
- **Server**
 - Web, application, database

©2010, NetForecast, Inc., all rights reserved.

Slide 15

Location Summary



- **Public points are harder to instrument but growing in popularity**
- **As more of IT is purchased as a service it is natural for enterprises to also purchase performance management tools as a service**
- **Both product and service offerings have value**
 - Again, there is no uniformly "correct" answer

©2010, NetForecast, Inc., all rights reserved.

Slide 16

Data



- **Data describes what information is gathered**
- **This is where the value of the tool transitions from clever to useful**
 - The data gathered feeds the subsequent parts of the framework
- **The tool should gather more data than needed for any single use of the tool**
 - You can never have too much relevant data
- **Data consolidation**
 - Because a lot of data gathered at an instrumentation location, it is often consolidated before passed on to the analysis section
 - Data consolidation can remove critical details you wished you could recover
 - Understand the consolidation approach
 - Have the ability to modify the consolidation approach

©2010, NetForecast, Inc., all rights reserved.

Slide 17

Data: What the Tool Supplies



- **Resource measurements**
 - Capacity (provisioned bandwidth (bits/sec), transactions/min, DB queries/sec, connections/sec)
 - Availability (provisioned service is operating)
 - Accessibility (authorized users can get to the service)
- **Usage measurements**
 - Utilization (percent available capacity in use)
 - Traffic by user or user group
 - Traffic by application
- **Event measurements**
 - User quality of experience (user-level response time, MOS, video quality)
 - Apdex data is gathered here
 - Response Time (packet, application turn, Task, server transaction)
 - Loss (packet, transaction, server error, DB query failure), Jitter

©2010, NetForecast, Inc., all rights reserved.

Slide 18

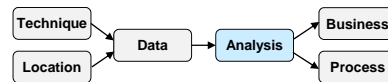
Data Summary



- **You need many of these data gathered**
 - Not all, but the important ones for your enterprise
- **The data that are gathered need to be accurate and carried into the subsequent parts of the framework**
- **Ideally any piece of measurement data should have the following identifiers**
 - Time
 - User identifier
 - Transaction instance
 - Application name, type, class, or group
 - Software component or subsystem
 - Hardware resource

Source: *High-Performance Client/Server* by Chris Loosley

Analysis



- **Turns data into information**
- **This is often where vendors compete**
- **The data must be easily accessed, manipulated, visualized, and made useful for the subsequent parts of the framework**

Analysis: How the Tool Provides Insight



- **Performance tracking**
 - Time of day
 - Location
 - Business function
 - Apdex is a tracking option
- **Trend analysis over long periods of time**
 - Apdex is a trending option
- **Correlation analysis across measurement data types**
- **Integration of data from multiple sources**
 - Including data from other tools
 - Including data from outside data feeds
- **Long-term data repository for data mining**

©2010, NetForecast, Inc., all rights reserved.

Slide 21

Process



- **The ITIL Information Technology Services Management (ITSM) framework defines processes**
- **Most of the ITIL processes deal with**
 - Implementation: delivering projects within schedule and budget
 - Operations: keeping systems working
 - Service model: Running IT as a service
- **Proper APM needs to determine the ITIL essential subset applicable to APM**
 - APM should not re-invent service process
- **Tool must directly support the APM processes**
 - Not secondary or indirectly from some tool view
- **Tool should be highly automated and integrated**
 - Not separate products with separate interfaces

©2010, NetForecast, Inc., all rights reserved.

Slide 22

ITIL Processes Related to APM



- **Service Operation**
 - Event Management
 - Incident Management ←
 - Request Fulfillment
 - Problem Management
 - Access Management
 - Operational Activities of Processes ...
 - Change Management
 - Configuration Management
 - Release and Deployment Management
 - Capacity Management ←
 - Continuity Management
 - Availability Management ←
 - Knowledge Management
 - Financial Management for IT Services
- **Continual Service Improvement**
 - Service Level Management ←

**Minimal set of processes
that relate to ongoing
APM delivery quality**

Source: ITIL v3, May 2007

©2010, NetForecast, Inc., all rights reserved.

Slide 23

How the Tool Supports APM Processes



- **Incident: resolving performance degradation**
 - Trouble ticket system
 - Actionable alarms with threshold controls
 - Diagnostic capability
 - MTTR tracking
- **Availability: service operation**
 - Ability to define availability terms
 - Historic data to determine trends
 - Availability (service is working) reports
 - Accessibility (users can access the service) reports

©2010, NetForecast, Inc., all rights reserved.

Slide 24

How the Tool Supports APM Processes (cont.)



- **Capacity: proper service resources**
 - Demand model (ability to project future demand)
 - Demand-usage correlation
 - Show over-utilized and under-utilized resources
 - Modeling “what-if” scenarios of change or growth
 - Apdex used in the scenario models
- **Service Assurance: meeting business needs**
 - Ability to define service targets: KPIs
 - Apdex can be a KPI
 - Continually monitor services and relate to the targets
 - Apdex is a reporting option
 - Integration of incident, availability, and capacity management data into single report
 - Benchmarking and assessing the effect of change upon the ability to meet the targets
 - Apdex is a benchmarking KPI

©2010, NetForecast, Inc., all rights reserved.

Slide 25

Business

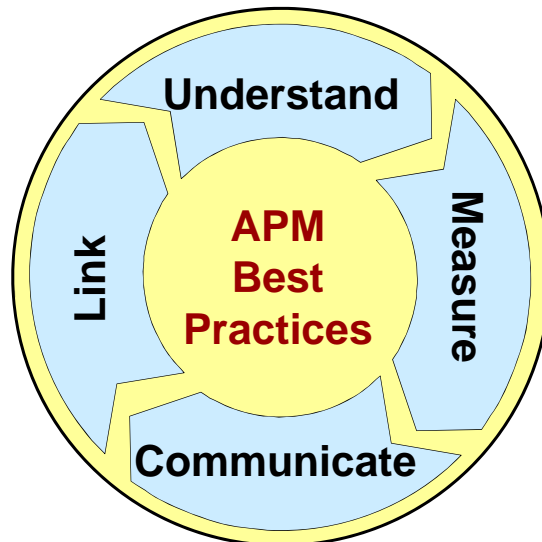


- **Business functions determine how the tool integrates with the business**
- **The APM tool should support the four application performance best practices**
 - Understand: automated ways to gather user/application/business requirements [Apdex option]
 - Measure: (implied in all of the above) [Apdex option]
 - Communicate: Effective reporting that can be tailored to a wide audience including operations, management, executives, customers, business partners [Apdex option]
 - Link: Built-in feedback mechanism for the audience to react to the reports [Apdex option]
- **The tool's interfaces and reports should be integrated into the business activity**
 - This is where the highest value from the tool is realized

©2010, NetForecast, Inc., all rights reserved.

Slide 26

APM Best Practices



©2010, NetForecast, Inc., all rights reserved.

Slide 27

How the Tool Supports APM for the Business



- **Understand: Tool provides ways to gather information**
 - **Users: who they are, importance, performance needs**
 - **Applications: what they are, importance, performance needs**
 - **Critical technical parameters: tool converts business needs to KPIs**
 - Apdex T and the Apdex score are parameters within the tool
 - **Ability to have management agree to the needs**
- **Measure: Tool shows the right information**
 - **Measure the critical technical parameters**
 - Apdex scores are one of the parameters shown
 - **Track measurements over time**
 - **Set critical thresholds for the parameters**
 - **Automate data gathering and correlation**

©2010, NetForecast, Inc., all rights reserved.

Slide 28

How the Tool Supports APM for the Business (cont.)

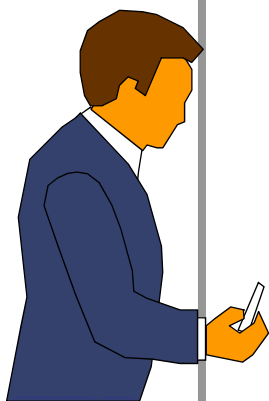


- **Communicate: Tool provides effective reporting**
 - Provide effective performance reports to management
 - Apdex is one of the reports
 - Easy way to have non-IT staff customize reports for their needs
 - Enable automated reports generation on a regular schedule
 - Generate reports for users, customers, business partners
- **Link: Tool supports direct management input**
 - Multi-user voting mechanism for performance targets
 - Confirmation mechanism for business critical applications
 - Tool generates application-level service assurance reports
 - SLR – Service Level Requirement
 - SLO – Service Level Objective
 - SLT – Service Level Target
 - SLA – Service Level Agreement
 - **Apdex methodology is an option incorporated in these functions**

©2010, NetForecast, Inc., all rights reserved.

Slide 29

Outline



- Framework Overview
- APM Tool Functional Areas
- Checklist Example
- Summary

©2010, NetForecast, Inc., all rights reserved.

Slide 30

New Relic RPM APM Functions Checklist



- **Technique**
 - Passive touch & Internal View
- **Location**
 - Server
- **Data**
 - Application turn time [with Apdex option]
 - Server transaction time
 - DB response time
 - Server error
 - DB query failure
- **Analysis**
 - Performance tracked by time of day
 - Performance tracked by application function
 - Apdex reporting
 - Trend analysis



©2010, NetForecast, Inc., all rights reserved.

Slide 31

New Relic RPM APM Functions Checklist (cont.)



- **Process**
 - **Incident: resolving performance degradation**
 - Actionable alarms with threshold controls
 - Diagnostic capability
 - **Availability: service operation**
 - Ability to define availability terms
 - Historic data to determine trends
 - Availability (service is working) reports
 - **Capacity: proper service resources**
 - Demand-usage correlation
 - Show over-utilized and under-utilized resources
 - **Service Assurance: meeting business needs**
 - Ability to define service targets: KPIs [Apdex]
 - Continually monitor services and relate to the targets [Apdex]
 - Integration of incident, availability, and capacity data into single report
 - Benchmarking and assessing the effect of change on the targets [Apdex]



©2010, NetForecast, Inc., all rights reserved.

Slide 32

New Relic RPM APM Functions Checklist (cont.)



▪ Business

▪ Understand: Tool provides ways to gather information

- Users: who they are, importance, performance needs
- Applications: what they are, importance, performance needs
- Critical technical parameters: tool converts business needs to KPIs [Apdex]
- Ability to have management agree to the needs

▪ Measure: Tool shows the right information

- Measure the critical technical parameters [Apdex]
- Track measurements over time
- Set critical thresholds for the parameters
- Automate data gathering and correlation



▪ Communicate: Tool provides effective reporting

- Provide effective performance reports to management [Apdex]
- Enable automated reports generation on a regular schedule
- Generate reports for users, customers, business partners

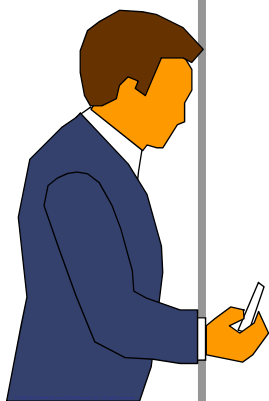
▪ Link: Tool supports direct management input

- Tool generates application-level service assurance reports [Apdex]

©2010, NetForecast, Inc., all rights reserved.

Slide 33

Outline



- Framework Overview
- APM Tool Functional Areas
- Checklist Example
- Summary

©2010, NetForecast, Inc., all rights reserved.

Slide 34

How to Use the Checklist



- **Develop your requirements**
 - **Select among the many alternatives in each functional area**
 - Do select some features in each area (don't skip an area)
 - **Prioritize the selections as**
 - Essential
 - Nice to have
 - **Turn the finished list into a shopping guide**
- **Evaluate your existing vendors**
 - **See how much is missing from your current APM tool vendor**
 - **Contact the vendor and find out if they can fill the gap**
- **You may need a new tool**
 - **Investigate new vendors**
 - **Show the vendors your requirements guide**
 - **Have them present how they will satisfy your needs**
 - **Select the new tool carefully**

©2010, NetForecast, Inc., all rights reserved.

Slide 35

Questions and Answers



Apdex Alliance Facts

Invented: by Peter Sevcik, first articles published in Jul 2002 and Nov 2003

Alliance founded: 2004

Alliance structure: non-profit organization

Objective: Define and promote effective performance reporting methods

Technology: Open standard freely available to all

Sponsors: 27 companies since 2004

Members: 2,000 individuals interested in following and implementing Apdex

Go to www.apdex.org for more information about Apdex
Join the dialog at the Apdex Exchange <http://apdex.org/blog/>

