6 APPROACHES TO MONITORING COMPLEX TIBCO-CENTRIC APPLICATIONS

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As Many Companies Adopt Hybrid and Cloud Strategies

They must continue to support their legacy applications which are running on older infrastructure. This can squeeze IT Operations and Support teams which are tasked with doing more with fewer and fewer resources.

In the TIBCO world, integration middleware is rapidly evolving from running in traditional on-premise systems to hybrid applications or even running entirely in the cloud. As companies architect for these environments, they are using new TIBCO products and services such as TIBCO BusinessWorks™ Container Edition, TIBCO FTL®, and TIBCO Cloud™ Integration (TCI). The challenge is how best to monitor and manage both the older and newer platforms efficiently.
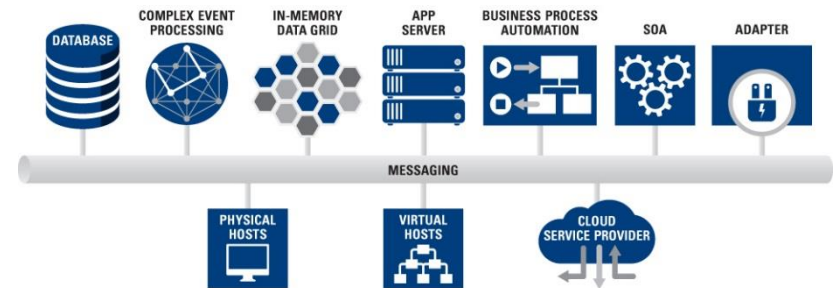
This document will review the most common methods for monitoring TIBCO environments and show why adopting an end-to-end monitoring platform to monitor on-premise, hybrid, or cloud applications and the supporting infrastructure is the best solution.

1 Common Monitoring Approaches for TIBCO Environments

Several approaches are used for monitoring TIBCO environments. Each has its advantages and ideal use cases. The most common methods are:

TIBCO Administration Tools

TIBCO Hawk®

TIBCO® RTView® Standalone Monitors

Application Performance Management (APM) Tools

Custom Built and Maintained Monitors

RTView Enterprise End-to-End Monitor

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2 TIBCO Administration Tools

Runtime monitoring is only one of many tasks that middleware admin consoles are designed to perform, so the monitoring capability in these tools is limited.

TIBCO users will always require admin tools to manage their environments. However, users often struggle with a multiple admin tool approach for monitoring complex environments.
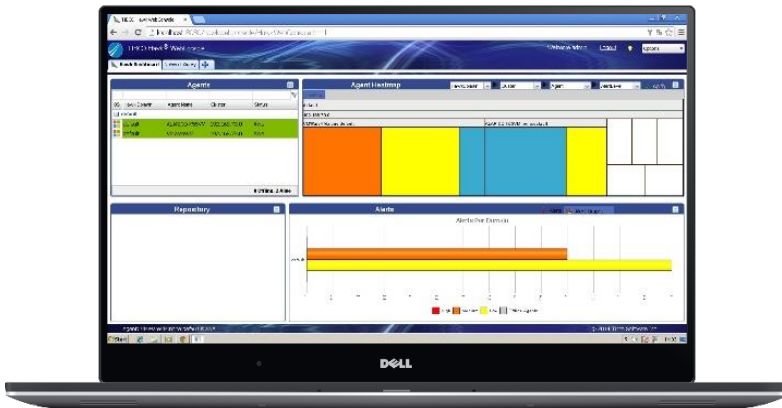
Admin tools are typically technology-specific and require users to manually work through each environment to look at individual instances to understand overall system health. It is challenging to understand the interplay between the different technologies during application run-time, therefore, understanding the business impact of one technology on another in real-time is almost impossible. Many administrators report that, upon receipt of an application alert, it can take upwards of 4 hours just to identify which component is failing and have no way of detecting if the failure is part of a larger pattern.

Administration tools do not provide access to historical information which can complicate troubleshooting since errors and issues can be transient and difficult to troubleshoot after the fact. The different tools also generate separate event and status information for each component.

For high-performance business-critical applications, the vast amount of TIBCO runtime health and status data that are generated is challenging to comprehend using an administration tool.

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2 | TIBCO HAWK®

TIBCO Hawk is TIBCO's legacy monitoring solution and is broadly used within TIBCO's core integration customer base.
It has been TIBCO's primary monitoring solution for monitoring on-premise, distributed applications, and systems for years.
It has proven to be very reliable and highly scalable with some implementations consisting of tens of thousands of rule-based agents.

However, TIBCO Hawk does have some limitations

Users cannot save historical data, making it difficult to troubleshoot issues after they have occurred.

Hawk interface does not lend itself to comparative analysis between engines, servers, and agents. Users must drill down to one engine or process individually which can be cumbersome.

Hawk does not aggregate metrics across domains or environments which can be limiting to users wishing to gain a better high level understanding of how their environments are performing.

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2 TIBCO® RTVIEW® STAND ALONE MONITORS

TIBCO RTView Standalone Monitors feature pre-built displays and pre-configured alerts

Since no programming is required, the monitors can be downloaded, configured and quickly deployed. These applications have been broadly used within the TIBCO customer base for several years and are licensed through TIBCO.

RTView Standalone Monitors complements Hawk in several ways. Users can:

- Develop custom displays driven by Hawk metrics and alerts using TIBCO RTView Standard Monitor (SL RTView Core)
- Archive Hawk metrics and alerts to relational and NoSQL databases
- Create displays that blend data from Hawk and other data sources such as SQL

TIBCO resells these separate RTView monitors for:

- TIBCO RTView Monitor for EMS™
- TIBCO RTView Monitor for BusinessWorks™
- TIBCO RTView Monitor for BusinessEvents®

2 | Application Performance Mgmt. Tools

APM tools are sometimes used for monitoring TIBCO middleware environments from the primary perspective of monitoring a transaction.

APM tools can be beneficial for the right use cases, such as finding and debugging issues in transaction flows, creating transaction profiles and providing application-centric performance views. Moreover, APM tools can be very good at identifying code-based bottlenecks. However, APM tools have limitations when used to monitor TIBCO environments:
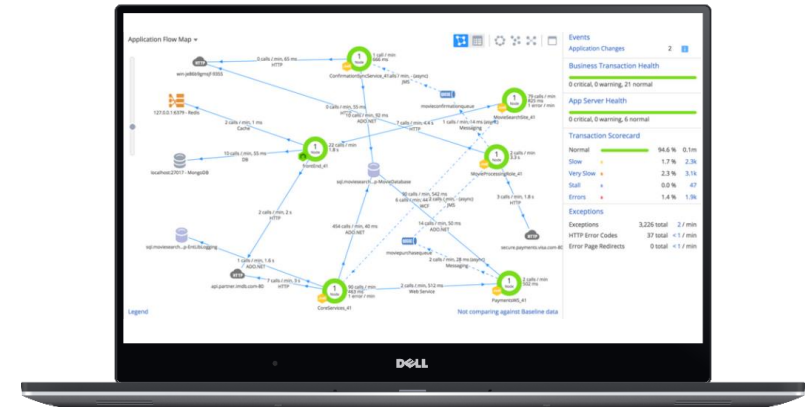
APM tools are not designed for service-level monitoring.

They provide an external look at the JVM and not deep visibility into the TIBCO middleware running inside the JVM. This is a material limitation because most TIBCO BusinessWorks problems occur at the activity level and not at the JVM level.

APM tools often have limitations around monitoring C-based applications such as TIBCO EMS™ and TIBCO ActiveSpaces®. Moreover, APM tools are unable to monitor EMS queues.

APM tools require the installation and maintenance of proprietary agents on every machine.

Maintenance costs will be higher since every product update and upgrade requires users to update every agent.

An APM tool can tell you where a transaction failed but not why since they have no transactional visibility into the entire TIBCO domain.

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2   Custom-Built & Maintained Monitors

Users always have the option of creating custom monitoring tools, and this is a useful approach for many organizations.

The build vs. buy decisions is complicated and outside the scope of this document.

That said, the time to build a custom monitor and ongoing expense of maintaining it, which includes modification and testing to every update of the middleware, often outweigh the benefits of creating an in-house solution.

And internally developed monitoring solutions are often dependent on one or two employees.

It can be difficult to maintain a custom-built system when these employees are reassigned or leave.

Custom-built tools can be very effective but require time to build and resources to maintain

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3 Becoming Proactive with End-to-End Monitoring

As middleware layers become more complex, small problems can quickly turn into big ones.

It is essential for support teams to be proactive with real-time monitoring and effective alerting to evolve beyond reactive incident management. One global retail bank we work with cited war room meetings often involving more than 30 attendees and one meeting in the previous year lasting more than 24 hours! They felt acute pain which they blamed on being stuck in a reactive mode.

Application and middleware support teams cannot work effectively without getting the right information, at the right time and in the proper format. Also, resources in one technology area need to be associated with the dependent resources in the other technology areas for Impact analysis to take place. General enterprise monitoring solutions do not meet these requirements and can result in significant time delays and communication problems.
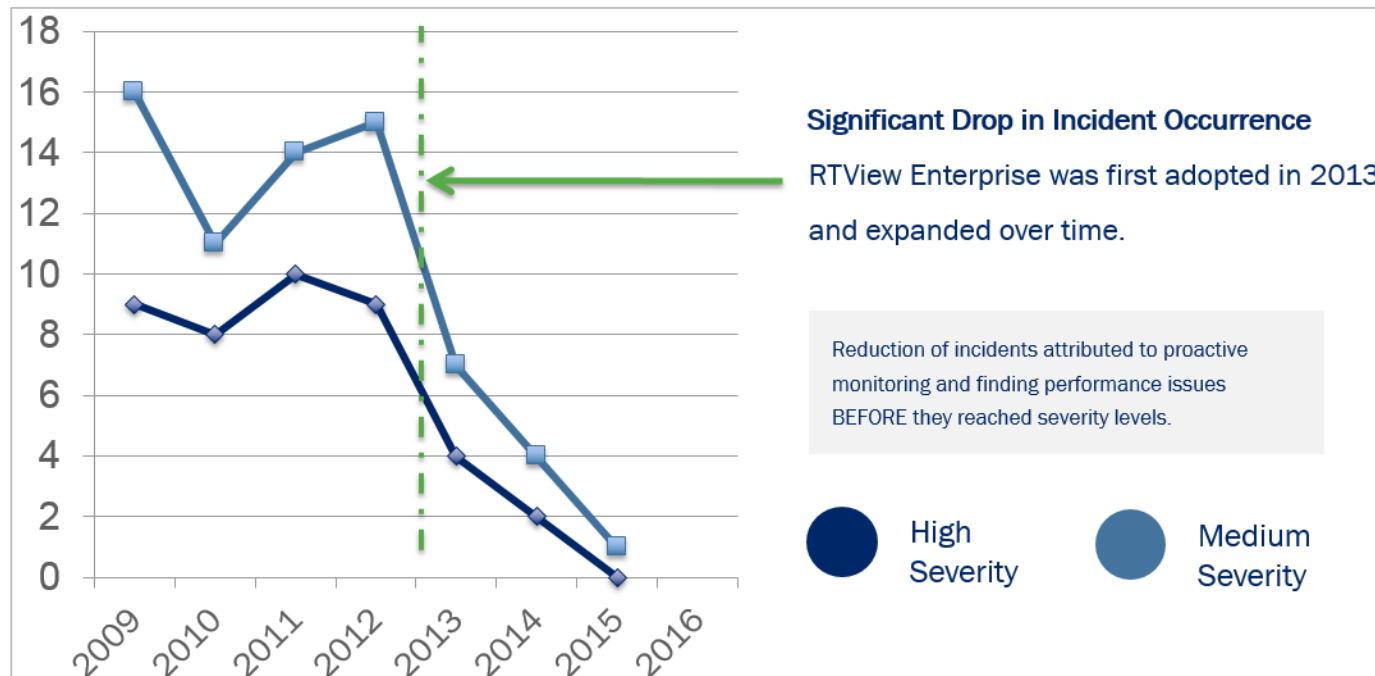
Proactivity requires centralized monitoring and alerting to minimize the lag time associated with navigating through different monitoring applications, alerting systems, and log files.

Business owners often require information about the health and availability of their applications and services. Unfortunately, they usually rely on Operations and Support teams for this when they would prefer self-service access to the information. Business owners are often tasked with contacting several Technology owners and acting as the communications hub when solving Sev 1 and 2 issues and the result is unnecessarily long resolution times and a great deal of frustration and confusion.

TIBCO middleware and support teams can proactively reduce Sev 1 & 2 incidents and lower MTTR with the proper middleware-focused monitoring tools

Benefits from Proactive Monitoring are Well Documented

3

Reduction in Severity 1 and 2 incidents as reported by a major U.S. bank at the TIBCO NOW conference in 2016.

Significant Drop in Incident Occurrence

RTView Enterprise was first adopted in 2013 and expanded over time.

Reduction of incidents attributed to proactive monitoring and finding performance issues BEFORE they reached severity levels.

High Severity

Medium Severity

4 RTView® Enterprise: End to end Monitoring for TIBCO-centric Applications
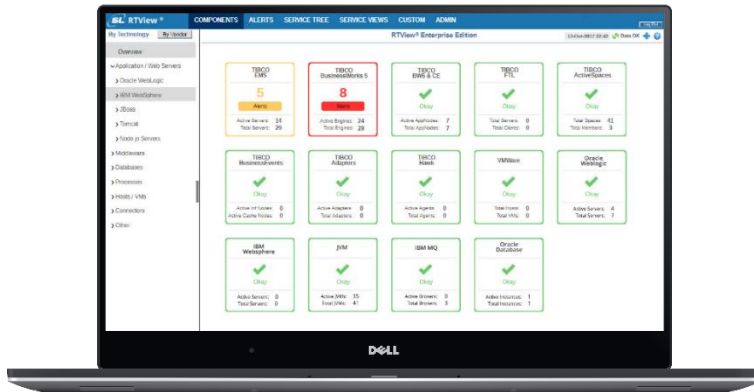

Figure: View the health of the entire TIBCO environment in a single display

RTView Enterprise Edition is used by many companies to monitor their custom and complex middleware environments more efficiently.

It is designed from the ground up to focus on middleware tiers and is often the monitoring application of choice for TIBCO middleware and support teams.

RTView Enterprise enables users to not only monitor the health and performance of a wide range of technologies but also to correlate the technologies that support a business service or application and quickly identify the actual cause of problems.

RTView Enterprise is designed for TIBCO middleware and support teams that require:

Consolidated Monitoring	More Powerful Diagnostic Tools	Historical Performance Information	Cross-Technology Correlations	Centralized Alerting Across the TIBCO Environment

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4 | Solution Packages

RTView Enterprise uses Solution Packages for gathering metrics and data from specific technologies.

These pre-packaged plug-in solutions include data adapters, internal memory caches, a rules engine, and a data historian and can access data via real-time asynchronous or query-based polling. Data is stored locally in internal memory caches to improve performance and persisted to a local data historian at configurable intervals.

Each Solution Package includes pre-built displays and pre-configured alerts, so no programming is required. During the configuration step, a simple configuration UI is used to connect each solution package to the each environment.

Figure: Solution Package summary views present the most crucial performance KPIs in addition to an abundant amount of historical performance information.
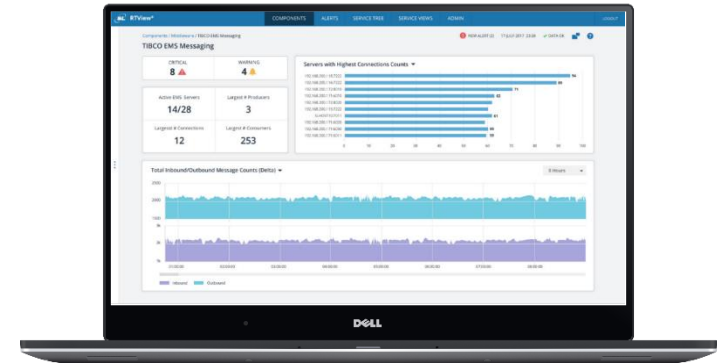
SL extends functionality for TIBCO RTView monitors with:

- Additional non-TIBCO solution packages
- Business service and dependency views
- Custom flow diagrams

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4 Solution Packages

A wide variety of Solution Packages is available for TIBCO technologies including:

SL supports a number of open source and commercial software from a number of vendors:

Fully-supported GA:

TIBCO BusinessWorks	TIBCO BusinessEvents	TIBCO ActiveSpaces	TIBCO FTL
TIBCO Adapters	TIBCO ActiveMatrix	TIBCO Hawk	

Field-supported:

TIBCO APIX	TIBCO BusinessConnect

kafka	amazon web services	solace	MuleSoft
docker	JS	mongoDB	JBoss
ORACLE Coherence	ORACLE WebLogic	ORACLE Database	ORACLE ENTERPRISE MANAGER
IBM WebSphere	IBM Websphere MQ	IBM DB2	Microsoft SQL Server
JVM's	MySQL		

Many companies that have licensed TIBCO RTView from TIBCO have also worked directly with SL to provide additional capability to extend the breadth of their TIBCO and non-TIBCO middleware monitoring. SL licenses RTView Enterprise Edition direct in these situations and also provides display and alert customization capability and supporting services.

4 | Historical Context

RTView intelligently caches data in-memory for instant access and can be stored persistently for long-term capacity analysis.

Time-series trend charts easily differentiate between transient spikes and slow-growth trends so users can respond appropriately. Users can even troubleshoot problems after the incident is resolved.

Effective troubleshooting requires rich historical information to identify transient issues and understand if a high metric value is a trend or a spike.

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4 Understanding Large, Complex Systems by Creating Logical Groupings
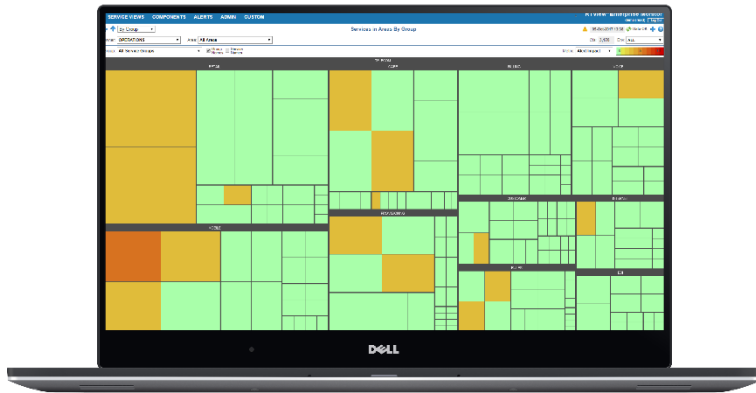
Figure: This heatmap provides a real-time health view of a system consisting of thousands of middleware components in logical business-oriented groupings

Groupings may be configured around business units, data centers, geography or any other logical entity.

When support teams have this knowledge, they are able to prioritize incident response more effectively.

Using the service model, uses are able to better understand large, complex systems by creating logical business or operational groupings of middleware and the infrastructure.

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4 Understanding How Components Can Impact a Business Service

RTView Enterprise uses the service model to correlate the different components that make up a business service or application.

Figure: This history heatmap shows the health of the components making up a business service over a two day period. It shows a correlation between a problem BW Engine and high CPU usage for a VMware host.

Using history heatmap views, users can correlate the key performance metrics of different components across an entire service to understand the root of a problem.

For example, a business service may be impacted by a slow performing component that is caused by an adjacent component in the service. History Heatmaps also show the stress levels, over time, for each of the resources required to support an application. This allows administrators to intelligently allocate resources (such as memory or CPU) to those devices that are under stress.

How can a user effectively troubleshoot a BusinessWorks issue without understanding the health of its upstream service dependencies?

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4 Support across Multiple Environments including the Cloud

Just as TIBCO can be deployed on-premise, in public and private clouds and containers, so can RTView Enterprise. RTView supports on-premise, hybrid, and cloud-only deployments.
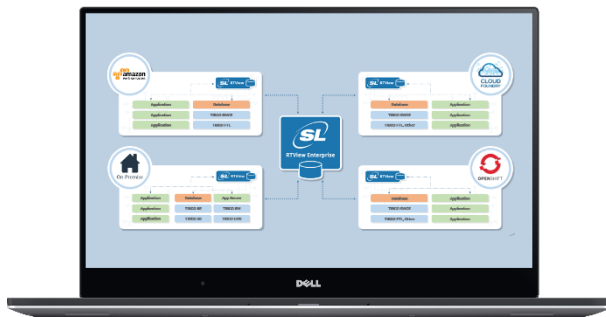
Figure: Distributed architecture. RTView data servers collect and process monitoring data locally and pass relevant information to the central RTView server layer only when needed.

RTView uses a distributed architecture where the data server layer is architected to collect and locally process monitoring data from any number of middleware and infrastructure sources. Source data is accessed agentlessly via API, stored in caches for fast access, aggregated, normalized and then made available to the metadata layer. Subsequently, relevant information is passed up to the RTView server layer where service-model integration and display logic is applied so that data can be viewed in a number of advanced visualizations, tailored by role or domain.

RTView's distributed data caches can be accessed from RTView Enterprise for consolidated visibility while customer data remains securely behind their firewalls providing an extra level of data security.

RTView Enterprise can enable organizations to monitor heterogeneous cloud platforms in addition to their on-premise environments. In this way, RTView can reduce the business risk of lifting and shifting workloads to the cloud.

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4 Centralized Real-Time Alerting and Notifications

With RTView Enterprise Edition

Users can centralize and aggregate monitoring information gathered from TIBCO EMS, BusinessWorks, and BusinessEvents Solution Packages and other technologies or tools such as TIBCO Hawk in a single alert view.

Centralized alert management can provide tangible benefits to the business because it allows users to detect patterns in anomalies and to correlate issues across the environment.
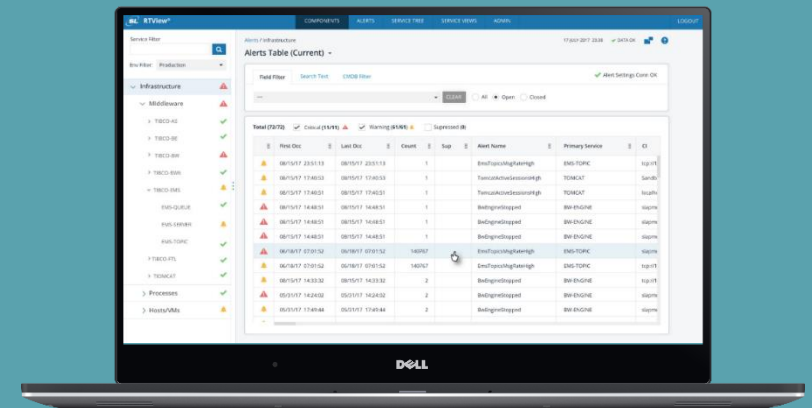
Support Teams and individual users can filter and view only the alerts they care about to minimize information overload.

Filters can isolate all alerts of a certain condition (for example pending messages or for a particular resource, BE server and for a specific Business service or application.

Centralized alert management can provide tangible benefits to the business because it allows users to detect patterns in anomalies and to correlate issues across the environment.

No TIBCO support team wants to receive alerts from multiple tools and platforms— in different formats, with varied content — at once. Centralized alerting will often provide an improved MTTR for issue resolution because there are fewer redundant alerts.

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4 Custom Displays and Flow Diagrams

RTView supports the automated and manual creation of custom diagrams and displays.

These are frequently used to make complex concepts and processes easier to understand. Visual diagrams can enable lower level support teams to be more efficient and less reliant on the level 3 experts.

Custom Flow Diagrams enable users to visualize end to end business processes with very granular performance and health data for all touch points and end points in that flow. This makes it easier to understand the flow of a business service and all the components supporting that service. Errors are highlighted enabling the user to take corrective actions before the incident become more severe.

Figure: TIBCO Transaction Flow Diagrams provide a visualize TIBCO transaction message flows and drill down to more detailed information.
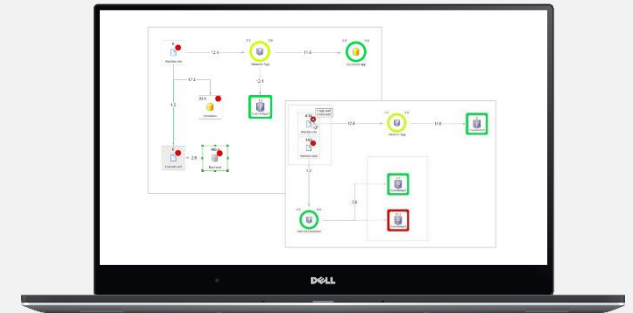
TIBCO Transaction Message Flow Diagrams allow users to visually highlight metrics including:

Message Throughput per minute with high and low alerting

Highlight failed transactions with appropriate drill downs to responsible component

Transaction message flow diagrams also embed links to tabular charts that provide an understanding of transaction behavior.

4 Integration with Other Monitors and Systems

Organizations often standardize on different monitoring and incident management platforms.

RTView plays well with these systems and can import data, such as host information to provide a better end-to-end understanding of the larger environment.

Figure: TIBCO BW performance data can be exported from RTView to other monitoring tools such as Splunk.
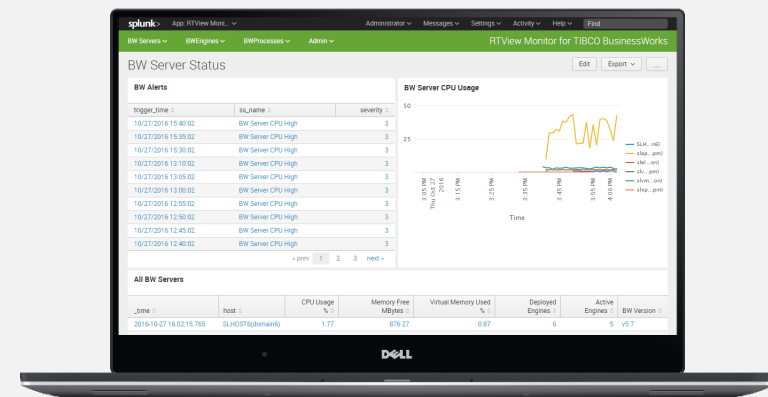
Users can also export RTView metrics and alerts to other third-party monitoring systems such as HP OpenView, IBM Tivoli, Nagios and Splunk via a REST interface or SNMP trap.

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4 | About SL

SL is a San Francisco Area-based software company that develops real-time monitoring, visualization and diagnostic software for Global 1,000 and mid-market companies whose businesses depend on complex, high-performance applications.

The company has deep expertise in monitoring and management of custom, distributed applications running in heterogenous middleware environments on-premise, in hybrid, or cloud environments.

The team at SL has a reputation for being one of the most responsive and knowledgeable companies in the industry.

Our customers and partners regularly comment on our great communications, the quick response of our technical team and the commitment of the executives and all lead technologists to ensure the success of all SL projects.

SL's customer support engineers have an average tenure of more than 15 years at the company.

They combine deep technical experience with a keen understanding of their customer's requirements to ensure a very high level of customer satisfaction.

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