

TIBCO Enterprise Management Advisor

Aligning IT and Business Processes
to Ensure Real-Time Business



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For most organizations, a gap exists between business activities and the IT infrastructure that is intended to support them. This gap can lead to significant problems including lost revenues and inability to respond to competitive threats and market opportunities. TIBCO has teamed with leading vendors of enterprise management software to develop a unique software product that bridges this gap and brings a business context to IT operations.

1. Barriers to Real-Time Business

Integrating applications and people allows organizations to more quickly respond to problems, resolve customer needs, and seize opportunities. Collectively, these advantages are referred to as real-time business. Real-time business is especially advantageous when events or conditions differ from what is normal or expected. For example, delivery trucks can have mechanical problems that prevent products from arriving on time; a server may crash just as customer orders peak; a natural disaster may prevent service teams from reaching customers. The ability to identify and address these situations as soon as they occur by adapting pre-defined operational procedures is critical to success in today's marketplace.

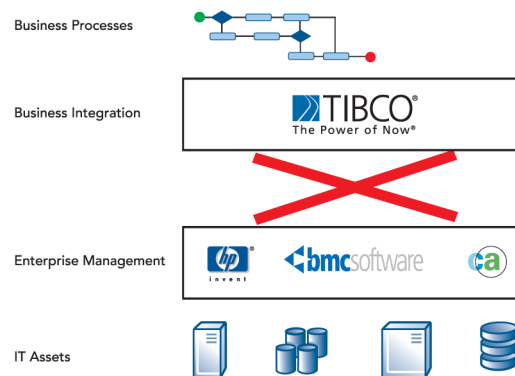
As these examples illustrate, many things can impact an enterprise's ability to conduct business activities. When infrastructure problems occur, they can have an immediate and severe impact on the business activities that rely upon them. For example, if a database used to track shipments fills up, the order fulfillment process can come to a grinding halt and remain undetected for days as IT personnel address other burning issues. Similarly, no one may notice that orders from the eastern states have slowed to a trickle – the result of a slowly degrading network component.

THE GAP BETWEEN BUSINESS ACTIVITIES AND IT INFRASTRUCTURE

IT departments usually do not know whether an infrastructure problem has negatively impacted a key business process or whether some business event is likely to affect the systems for which they are responsible. Until now, businesses have had no way to link their IT infrastructure (i.e., business systems, applications, and network infrastructure) to their business processes. For example, an organization may use TIBCO's software to coordinate activity and order flow between CRM, ERP, and mainframes – and an enterprise management (EM) software product (such as HP OpenView) to monitor the underlying infrastructure (to ensure that the databases they depend on are running correctly, the disks are not full, the network is not congested, and the servers are not overloaded). In

this typical scenario, the business process world and the infrastructure world are unable to share information.

Figure 1.
In this scenario, there is no link between business processes and the IT resources that support them.



An organization without sophisticated process and infrastructure monitoring tools has even less insight into its enterprise network, which can have literally tens of thousands of dependencies between the software, hardware, databases, and data centers and the business processes they support. Such complexity makes it nearly impossible to visualize and understand how these elements are related. And without complete business/IT visibility, organizations cannot answer seemingly basic questions, such as:

- What IT resources support each business process?
- How do the IT resources at our partner locations impact how well our business runs, and can a problem at their end impact all of our other partners?
- What line of business will be affected if an application, server, or data center goes down?
- Who needs to be notified when service-affecting events like these occur?
- Is there an automated work-around to restore the service immediately when events occur?
- How must the IT infrastructure change in order to fully support company growth plans and strategic business initiatives?

- What is the true business impact of adding, changing, or removing an IT component?
- Are IT expenditures strategically helping the business to grow revenue, reduce costs, establish competitive advantage, or achieve other business goals?
- Are IT expenditures aligned with current business opportunities?

IMPACT OF THE GAP

The lack of combined insight into IT infrastructure and business process relationships makes it nearly impossible for most companies to achieve the business/IT alignment that organizations strive for. The consequences of poor alignment can be costly – and can significantly impair an organization’s ability to compete. Most importantly:

- The business cannot quickly adapt business processes in order to circumvent problems in the IT infrastructure.
- IT purchases and projects typically are not driven by key business needs, resulting in potentially wasteful IT spending that does not support business priorities or help the organization evolve.
- IT staff spends time addressing low-priority issues instead of urgent issues that impact critical business activities.
- There is no way to accurately assess SLA compliance from a business perspective, resulting in significant dollar losses via failed attempts at quantifying such information.
- Neither business process owners nor IT can respond quickly to changes in the business or to the business, resulting in missed opportunities and higher operational costs.

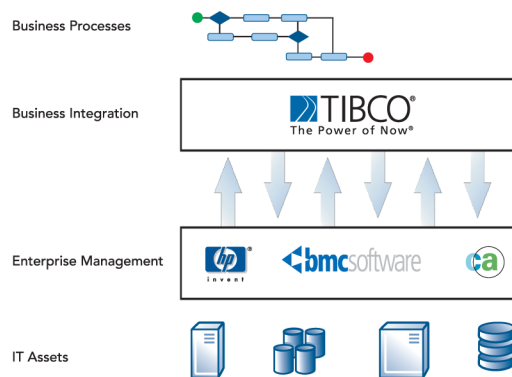
What is needed is a solution that closes the gap between business and IT by providing total visibility into IT and business process worlds, ensuring business continuity even when IT infrastructure fails, and enabling operational excellence through accurate service level metrics and trend analysis.

2. Aligning IT and Business Processes to Ensure Real-Time Business

Clearly companies need a solution that enables a direct, two-way exchange of data between business processes and IT monitoring systems. To return to the prior example, users of business process software could benefit by a direct exchange of system-level events relating to the health of IT systems, and users of enterprise management (EM) platforms could benefit by understanding business process dependencies on the underlying IT systems they monitor. As part of a strategic initiative called enterprise management integration (EMI), TIBCO is teaming up with leading providers of EM solutions to deliver software that helps companies understand the impact of business events on infrastructure and vice versa – as well as to automate actions required to keep business processes working even as infrastructure problems occur.

TIBCO ENTERPRISE MANAGEMENT ADVISOR

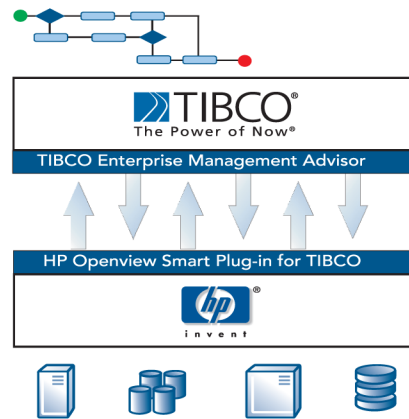
Figure 2.
In this scenario, there is a link between business processes and IT resources supporting them.



TIBCO Enterprise Management Advisor™ software aligns business needs with IT resources so that, in the event a critical infrastructure component fails, business processes can adapt in real time to ensure business continuance. Leveraging years of knowledge gained from deploying TIBCO Hawk® monitoring and management platform, Enterprise Management Advisor works with EM platforms to give administrators and business managers complete insight into system, network, application, and business process data. Using this information, organizations can identify problems as they arise, analyze them in context of the impact they will have on key business activities, and address them before they impact customers, partners, and the bottom line.

Specifically, Enterprise Management Advisor enables the integration of business process data with infrastructure data contained in EM platforms such as HP OpenView. This integration enables a bidirectional data exchange between the interfaces of TIBCO's software and EM platforms. By removing barriers between EM applications and the business integration software that manages business activities, Enterprise Management Advisor makes it possible for business managers and IT staff to analyze developing situations, identify and initiate the best course of action, and take steps to ensure business continuity and the satisfaction of service level agreements.

Figure 3.
Enterprise Management Advisor enables alignment of business process and IT data, ensuring that business activity can be sustained despite IT resource problems.



For example, with Enterprise Management Advisor, a business process can be altered automatically when a business impacting condition has been identified (such as 80 percent or higher utilization of a business-critical server). By taking action, the business service can continue uninterrupted while IT operations personnel resolve the initial IT resource problem.

In conjunction with EM platforms, Enterprise Management Advisor:

- Provides complete visibility into low-level systems, network components, and application services, and the business processes that these resources support.
- Enables business processes to automatically adapt to events in real time to avert IT resource problems or to leverage opportunities (i.e. ensure business continuance without human intervention).

- Allows business process owners and IT staff to understand and manage from the perspective of the infrastructure's impact on business processes (and prevents IT from resting on the false assumption that a healthy infrastructure means healthy business).

3. Key Areas of Value

Enterprise Management Advisor delivers value in three areas: total visibility into IT infrastructure and business processes, business continuity, and operational excellence.

TOTAL VISIBILITY

Providing IT with the business context it needs to mitigate the risk of IT failures

IT personnel can work with business process owners to manage a business process rather than working with infrastructure boxes. When an IT component has a problem and is recognized by an EM platform, IT managers now know the business process steps that will be directly impacted. Consequently, they can make informed and faster decisions to ensure business processes are not impacted by the problem – and the business continues without any performance slowdowns.

Focusing IT resources on business objectives

Enterprise Management Advisor enables the identification of the system and network resources required to implement each critical business process, allowing IT personnel to focus on those resources and work with business owners to keep key processes running at peak efficiency. By providing business context to the infrastructure managed by IT, all teams are focused on critical aspects of the business and can budget accordingly.

BUSINESS CONTINUITY

Adapting business processes to avoid degradation and downtime

Performance degradation of system and network components can dramatically impact business processes, but such problems can be averted. A management platform such as HP OpenView notifies TIBCO's software that a resource's performance is starting to degrade and may disrupt a key business process as a result. Pre-determined TIBCO business logic can then dictate viable options for assuring the business activity continues without any impact.

Enabling the business-driven adaptation of infrastructure

The needs of critical business processes can change suddenly and unpredictably, and the network infrastructure supporting them frequently needs to be modified in response. TIBCO's software enables the creation of contingency plans that can be implemented when a business process demands the sudden addition of new infrastructure resources. As a result, IT resources are used to directly support the evolving demands of the business.

OPERATIONAL EXCELLENCE

Managing service level agreements and reducing payment for those not met Service Level Agreements (SLAs) define the objectives that an internal IT team or outsourcing company must meet to satisfy their client's needs. The achievement of these objectives is typically determined by gathering specific metrics about the IT resources, and then determining if these results meet, exceed, or fail to meet the standards set out in the SLA. Enterprise Management Advisor makes available new metrics for analyzing SLA compliance. These metrics are more meaningful to both client and provider because they provide information about both business processes and the infrastructure that they run on, enabling business-centric SLAs to be created. Moreover, the outsourcer and client have complete visibility into the IT components critical to assuring availability of any business service and can determine if contractual commitments were met or exceeded. This insight enables outsourcers and IT teams to evolve their service offerings to best meet the needs of their clients.

Using business process requirements to dictate IT infrastructure spending

With the linkage between business process and IT infrastructure now made, businesses can make informed decisions about providing additional IT resources to support critical business processes. With Enterprise Management Advisor, there is simply more justification for IT expenditures – because strategic planning for future expenditures can be linked to the specific needs of the business. In making decisions, IT management can focus on business processes, not just on the infrastructure supporting them.

A FOUNDATION FOR PREDICTIVE BUSINESS

Enterprise Management Advisor also lays the foundation for what TIBCO believes is the future of business: moving beyond real-time business to predictive business. Many business operations follow patterns that, if identified, might allow for pre-emptive behavior that could prevent problems from occurring (or allow businesses to fully leverage emerging opportunities). Whereas real-time

business is about responding faster than competitors, springing into action to address a customer need, and capturing opportunities ahead of the competition, predictive business is about avoiding problems altogether, anticipating customer needs and growth opportunities, and proactively meeting them.

Enterprise Management Advisor lays the foundation for predictive business by enabling business process owners to build into processes any number of automated, intelligent responses to events. For example, TIBCO's software can automatically notify systems across the organization that 15,000 orders were processed last hour and that trending indicates the business will process an additional 25,000 in the next hour. In response, resources can be proactively reallocated to handle the anticipated spike in orders. This kind of optimization can only be made when system-level events are correlated with business events and vice versa.

4. Required Components and Functionality

Closing the gap between IT and business requires Enterprise Management Advisor and the following components:

- Hawk (or TIBCO BusinessWorks™, which utilizes Hawk infrastructure)
- EM software such as HP OpenView

TIBCO HAWK

TIBCO Hawk is a sophisticated, agent-based software product that enables system administrators to monitor and manage distributed applications and systems throughout the enterprise. Hawk is used as the management framework for BusinessWorks business integration software, and can be used as a standalone application monitoring and management solution. As part of TIBCO's EMI solution, Hawk teams with Enterprise Management Advisor to enable business services to avert IT resource problems.

Hawk provides the following capabilities:

- **Gather data:** Hawk agents obtain event and statistical information about the health of all TIBCO-monitored components and the business processes

supported by those components by monitoring TIBCO application and messaging backbone parameters; performance activities for all nodes in a local or wide area network; operating system data including process data, disk, and CPU utilization; log and system files; and network statistics. This Hawk data, combined with TIBCO business process relationship and dependency information, is forwarded to Enterprise Management Advisor and then to an EM platform, such as HP OpenView, which then correlates it with IT data to determine if a business-impacting IT problem is emerging.

- **Perform actions:** Local Hawk agents are configured with rule bases consisting of rules that define specific actions to take in response to tests applied to monitored data. These actions can include simple tasks such as restarting a failed process or publishing an alert message to notify administrators. More sophisticated responses can also be developed so that, for example, the internal behavior of an application is modified in real time or a set of applications that make up a business process are reconfigured as the result of a notification provided by Enterprise Management Advisor.
- **Avert the problem:** When the EM software determines that a business process will be negatively impacted by a supporting IT infrastructure problem, this information is communicated first to Enterprise Management Advisor and then to TIBCO messaging software and/or Hawk. Hawk can then alter the affected business processes according to the rules previously defined. Automated actions can be varied and are dependent upon the unique environment of each enterprise, such as:
 - Starting up another TIBCO component to assure the business process is rerouted around infrastructure problems
 - Stopping the operation of problematic IT systems to avert further problems
 - Storing the transaction in a persistent storage for later retrieval and processing
 - Notifying business operational staff via operations portals

BusinessWorks software is available with the Hawk agent capability and can also be used to define how a business process should change to avert IT problems.

5. Three Steps to Business/IT Alignment and Business Continuance

Functionally, these components work together to provide a closed-loop, continuous process for ensuring business continuance. Key steps include:

ALIGNING BUSINESS PROCESSES AND THE IT INFRASTRUCTURE

The EM platform collects IT infrastructure data and integrates it with the business process and infrastructure dependency data obtained from TIBCO's software. These two data sources are then correlated to display the business activities and the IT resources (applications, databases, servers, etc.) supporting each business process.

ASSESSING WHETHER AN IT PROBLEM WILL NEGATIVELY IMPACT BUSINESS PROCESSES

The EM platform analyzes each IT infrastructure problem alert it detects and applies threshold analyses to determine whether an IT infrastructure problem will negatively impact business process performance.

ACTING TO ENSURE BUSINESS PROCESS CONTINUANCE

If the EM platform determines that an infrastructure problem will indeed have a serious impact on all or part of a business process, this notification is sent back to TIBCO's software. The business-impacting event triggers the activation of pre-defined rules that dictate the specific steps to take to alter the business process and prevent performance degradation.

In this way, TIBCO's software teamed with EM platforms provides organizations with the power to effect immediate change in the way that IT resources are allocated and business activities are executed. It also allows organizations to quickly reorient activities and reallocate assets in response to events and conditions that represent opportunity, as well as to fine-tune their operations for optimal performance.

6. Enterprise Management Advisor at Work

The following scenario illustrates how Enterprise Management Advisor works together with EM solutions to provide business continuance, total visibility, and operational excellence.

A TYPICAL CUSTOMER SCENARIO

The Widget Corporation has just implemented an expensive marketing campaign to encourage existing customers to upgrade to a new cellular service. The purpose of the campaign is to convert their customers to the new service and stop them from migrating to competitor offerings. Customers have been notified about the campaign via direct mail, and in response an enormous number have come to Widget's website to request the new service. In the first three days of the campaign, the results have exceeded expectations, but on the fourth day the company sees a sudden drop-off in new upgrades. Tensions mount as those involved in the campaign watch the new trend. What is the problem?

OUTCOME WITHOUT ENTERPRISE MANAGEMENT ADVISOR

Without the benefits of Enterprise Management Advisor, it is impossible to determine whether an IT issue is underlying the drop-off in activations or if something else is causing it. Thus, the IT operations person does not even know that the marketing campaign is potentially being impacted by an infrastructure problem, and the business manager has no way to quickly determine the source of the problem. Without complete IT visibility, both business and IT must operate in the dark.

Jill: Customer	Sydney: Business Process Owner	Paul: IT Operations Manager
"Sounds like a great new service. But I'm tired of trying to register – this is my third time. It just doesn't accept my information. This is totally unprofessional and very frustrating – forget it."	"The campaign has been overwhelmingly successful until now. I can't believe something is going wrong. Does anyone know why the number of activations has gone to nearly zero? Do we have an IT problem or is something else going wrong? What do we need to do to fix it now?"	"Doesn't look like there are any more red icons on my management console today. No more problems."

As time goes on, the Widget Company runs the risk of losing even more customers like Jill
– and it may take IT days to identify and then solve the problem.

OUTCOME WITH ENTERPRISE MANAGEMENT ADVISOR

With Enterprise Management Advisor, the IT Operations Manager can see the IT resources used to support the critical new cellular activation campaign. Proactively, he defined a workaround to ensure that the business process could be altered to avert any IT resource problem that might emerge. He noticed that a critical server is starting to degrade and would have impacted the cellular activation process, but the business process has already started to use a second server for the cellular service activation.

Jill: Customer	Sydney: Business Process Owner	Paul: IT Operations Manager
"Sounds like a great new service – and it's so easy to order!"	"The campaign has been overwhelmingly successful to date. I can see that all is going well. The IT team let me know there was a problem, but they proactively addressed it – as always. Looks like the campaign will do better than we expected."	"It looks like the host server supporting the customer activation process is degrading. Not a problem – because I have already built in a workaround plan using Enterprise Management Advisor and Hawk. I've made sure that the user registration process will automatically use another host server if there's ever a problem with the first one. When I let Sydney know about the IT change, he wasn't concerned and mentioned that the campaign is generating lots of business."

In this scenario, the campaign continues to attract customers to the site, and customers can quickly and easily activate the new service. The campaign meets and exceeds expectations, locking in customers and bringing in revenue.

BEHIND THE SCENES

As this scenario suggests, ensuring business continuity is vital to business success. In this case, the Widget Corporation uses Enterprise Management Advisor, Hawk, and HP OpenView so that critical business processes are protected from the impact of infrastructure problems. Here's how the solution worked behind the scenes:

Step 1: Create the Business Process

Since Widget Corporation had invested in BusinessWorks integration software, the business process steps required to take an order from an online customer – all the way through to actually activating the services and updating their monthly bill – had already been created using this tool. Because this was the company's major campaign for generating new revenues this quarter, the entire process had to be managed and monitored closely. Consequently, the company had installed Hawk to guarantee top-notch monitoring and management of the entire business

process. And to proactively circumvent IT issues that might arise, Widget had also invested in Enterprise Management Advisor.

Step 2: Prepare for the Upcoming Campaign

With the business process steps clearly defined, Paul could use his HP OpenView console to see the actual infrastructure components that each step in the new cellular activation process depended upon to function. The business process data and dependencies gained from BusinessWorks Integration software, combined with Hawk, were forwarded through Enterprise Management Advisor to HP OpenView for analysis.

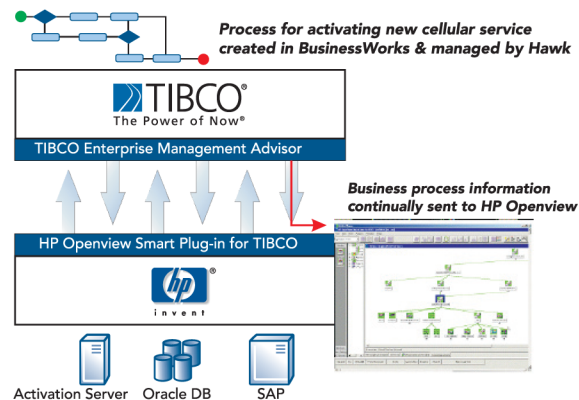
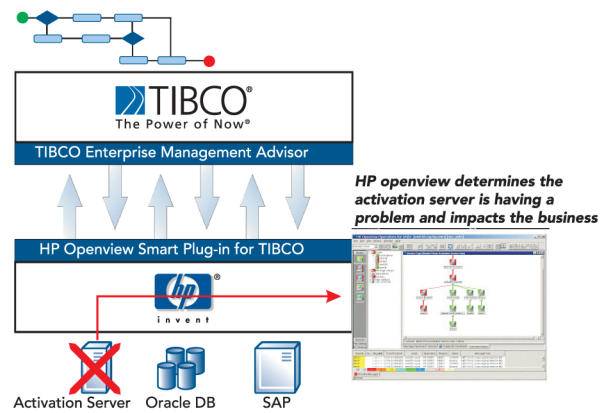


Figure 4.
HP OpenView shows the IT infrastructure that supports the business process.

Step 3: Ensure Business Process Operations

Given the importance of the new marketing campaign, Paul had created rules in HP OpenView based on correlations of event information obtained from the TIBCO business process data and HP OpenView infrastructure data. He then used these correlations to determine whether different IT problems would potentially impact the business process for the campaign. The resulting rules were used by HP OpenView to determine when to send warnings about business-impacting infrastructure problems to him and the TIBCO software. With complete visibility into the IT infrastructure and business process and an alert system in place, Paul was empowered to handle any problem quickly and efficiently.

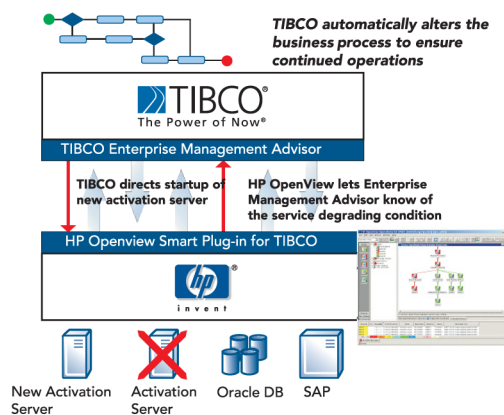
Figure 5.
HP OpenView identifies an IT resource problem that will affect the business process. This data is forwarded to Enterprise Management Advisor and to TIBCO's software for action.



Step 4: Adapting the Business Process

Paul also implemented proactive, real-time solutions to address potential infrastructure problems that could bring down the business process. To do this, he wrote rules to enable BusinessWorks and Hawk to automatically adapt the business process and avert any IT resource problems that might develop. For example, in the scenario above, Paul created a rule that, in the event the activation server failed or degraded, the business process would adapt by automatically transferring the process to another server. In this way, Paul ensured business continuance and prevented campaign failure.

Figure 6.
Based on pre-set rules, TIBCO's software takes action to ensure business continuance.

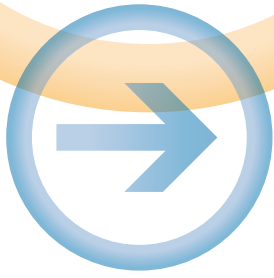


7. Conclusion

By creating a bi-directional link between enterprise data and business data, and enabling complete insight into the relationships between them, Enterprise Management Advisor opens the door to new possibilities for real-time business management. For the first time, business process owners and IT can work together to:

- Understand the relationship between business processes and the IT resources required to carry out both simple and complex business activities
- Set up automated notifications when service-affecting conditions occur
- Create rules that automatically adapt business processes – without human intervention – to ensure business continuance
- Give IT the resources to support and enable business processes
- Measure and validate that service commitments are being met or exceeded.

With these capabilities, business process owners and managers can rest assured that if and when problems occur, business processes will continue and IT has the information it needs to identify and solve the problem, and to avert similar problems in the future. And, with the ability to act on real-time information, organizations can more quickly respond to constantly changing business conditions and customer demands.



8. About TIBCO

TIBCO Software Inc. (NASDAQ: TIBX) is a provider of infrastructure software for companies to use on-premise or as part of cloud computing environments. Whether it's optimizing claims, processing trades, cross-selling products based on real-time customer behavior, or averting a crisis before it happens, TIBCO provides companies the two-second advantage™ – the ability to capture the right information at the right time and act on it preemptively for a competitive advantage. More than 4,000 customers worldwide rely on TIBCO to manage information, decisions, processes and applications in real time. Learn more at www.tibco.com



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