

TIBCO & NetScaler: Better together

How NetScaler complements TIBCO
BusinessWorks and TIBCO BusinessConnect



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Introduction

This Technical Solution Brief details how NetScaler can be used with TIBCO BusinessWorks & TIBCO BusinessConnect to enhance the availability, security, and performance of your applications.

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TIBCO BusinessWorks integrates the applications, data, and devices that are critical to your business operations. With TIBCO BusinessWorks software, your integration specialists can implement application integration strategies using both traditional enterprise integration patterns as well as modern API-led and event-driven approaches built with microservices and containers.

TIBCO BusinessConnect is an integration solution that automates and integrates your business processes. It enables secure exchange of information and automation of transactions across public and private networks, allowing you to safely and efficiently interact and collaborate with your customers, vendors, and trading partners.

NetScaler is a comprehensive application delivery and security suite for on-premises and hybrid multi-cloud applications. It provides load balancing, TLS termination,

advanced content routing, global load balancing, web application firewall, Kubernetes ingress, and application observability capabilities for traditional 3-tier web applications, and microservices based architecture. NetScaler is available in multiple form factors such as virtual machine (VPX), container (CPX), linux process (BLX), multi-tenant hardware (SDX), or as a single-tenant hardware (MPX).

Why use NetScaler for proxying both TIBCO BusinessWorks and BusinessConnect

The key benefits of proxying TIBCO BusinessWorks and BusinessConnect with NetScaler:

- Intelligent **health monitoring** that enables better resilience and fault tolerance, as well as ensuring availability of TIBCO apps during upgrades & maintenance lifecycle events
- Improve **security posture** of both TIBCO BusinessWorks and BusinessConnect instances, in addition to Apps/APIs/Databases that TIBCO products integrate with
- Monitor **Apps/APIs and troubleshoot** issues such as latency issues or server errors
- **Unified deployment and support** across TIBCO and NetScaler products, enables better user experience, improved efficiencies, and better business outcomes”



Intelligent health monitoring & lifecycle management

Intelligent health monitoring means that NetScaler will avoid sending requests to a BusinessWorks or BusinessConnect instance that is down or unable to respond (for example - due to networking issues outside the scope of the BusinessWorks administrator), thus maintaining system availability, performance, and efficiency at all times. There are several built-in monitors to check on services and handle the most common protocols: PING, TCP, SSL, HTTP/S, UDP, and many more.

Besides supporting built-in protocol monitors like traditional proxies, NetScaler also allows you to create custom/scriptable monitors which is especially relevant in today's business where applications are becoming increasingly more complex and customized. With NetScaler, one can easily create user monitors to track the health of customized applications and protocols, load monitors that can monitor user defined server metrics (such as system resource utilization like CPU, memory, connections), or inline monitors that can analyze live traffic for better load balancing decisions. For example, you can create a custom monitor to not send traffic to specific unhealthy BusinessWorks or BusinessConnect instances that are showing high latency. You can create a scriptable monitor on NetScaler to send a specific test payload and measure response latency in this script itself. If this observed response latency is more than desired, further requests to this temporarily unhealthy instance can be diverted to other healthier BusinessWorks or BusinessConnect instances.

During upgrade & maintenance of TIBCO BusinessWorks & BusinessConnect instances, NetScalers can be used to mark those specific instances as unavailable without impacting availability of BusinessWorks or BusinessConnect service as a whole. To provide an optimal user experience, NetScaler can gracefully drain connections. This prevents teardown of active connections during maintenance and upgrade activities, avoiding disruption of services that are sensitive to downtime. NetScaler goes a step further by not only providing static but also dynamic mechanisms to drain the connections. This allows upgrades & maintenance as per modern blue-green or canary deployment practices and specific app needs.

Application protection from L3 to L7 Attacks

NetScaler provides comprehensive protection for these TIBCO apps with its integrated Web Application Firewall (WAF) and bot mitigation modules. For example, unpredictable vulnerabilities such as Log4j and Spring4Shell were quickly mitigated by NetScaler's WAF solution.

BusinessWorks and BusinessConnect can be protected against future critical vulnerabilities, while the software is getting patched. This provides IT Ops with a quick way of virtual patching to mitigate attacks, thus saving time and effort. The NetScaler WAF utilizes a hybrid security model - it uses signatures to efficiently detect known application attacks and positive security with application learning to defend against zero-day attacks.

With NetScaler WAF's rich content inspection and protection capabilities, it is easy to safeguard against the OWASP top 10 security vulnerabilities, including OWASP top 10 for REST/SOAP APIs (SQL injection, buffer overflow protection, cross-site scripting attacks, threat protection for JSON or XML contents such as malicious code/objects, badly-formed XML/JSON requests, Denial of Service) as well as the more advanced, application-specific threats like cookie consistency and hijacking attacks. NetScaler WAF integrates with many of the top application vulnerability scanners—Cenzic, Qualys, WhiteHat, and more—which means you can turn scan results into deployable policies with just a few clicks.

NetScaler bot management detects various sophistication levels of incoming bot traffic and mitigates bot attacks to protect BusinessWorks and BusinessConnect applications. NetScaler can identify bad bots as well as good bots, permitting access to those deemed safe and preventing access to malicious bots intending to launch an attack. To do this, NetScaler utilizes a variety of techniques to identify bot threats—IP address lists, dynamic IP reputation, signatures of known bots, device fingerprinting, and bot traps. Once bot traffic is identified it can be dropped, rate limited, redirected to another resource, or challenged with a CAPTCHA.

For Layer 3 security, NetScaler's IP Reputation Service can be used to block bad actors and protect TIBCO apps. Additionally, NetScaler's rate limiting capability can protect TIBCO BusinessWorks and BusinessConnect from being overloaded with unusually high requests. Rate limiting can be done based on various parameters such as Client IP, API Key, request parameters (like Header, URL, Cookies), and various other parameters based on application needs.

NetScaler uses a single-pass architecture for traffic processing that enables it to perform many functions including security functions in a single pass, reducing latency, and improving performance. This is a key value differentiator for NetScaler customers. This is especially true for WAF inspection, where the latency of each request can be reduced significantly - leading to better security, less complexity, and a lower TCO. By utilizing a NetScaler, TIBCO apps gain advanced levels of protection that are out of scope for an application to handle alone, such as OWASP Top 10 attacks or HTTP flood attack.

Observability and troubleshooting application performance

NetScaler with ADM service can provide analytical insights and recommendations for your BusinessWorks application health, performance, and security. Here are some of the common use cases.

BusinessWorks app slowness root-cause analysis:

NetScaler along with ADM service in front of BusinessWorks applications can learn the baseline response time for the app and highlight those with response times that deviate from the norm. It provides insights into contributing factors — client network latency, server network latency, and server processing time to isolate slowness or latency issues.

BusinessWorks app SSL certificate lifecycle analytics:

BusinessWorks application owners can view the SSL certificates bound to their apps and track their expiry. NetScaler ADM provides rich capabilities such as creation of CSR and SSL certificates, installation of SSL certificates, monitoring SSL certificates and SSL negotiated transactions, notification about expiring/expired



Figure 1. This is an example dashboard illustrating that high server processing time is what's causing this app to slow down.

App server errors analytics: NetScaler along with ADM service for BusinessWorks applications can identify application instance issues that degrade app performance, as well as deliver recommended mitigation measures. It can identify and report in real time server issues like 5xx errors, overloaded app server surge queue build up, low active usage of bound services, service flaps, and servers with anomalous response time.

certificates, updating expired certificates, and deletion of unused certificates. These features all greatly improve productivity and visibility for application performance.

In addition, insights about application health can be exported from NetScaler to popular observability endpoints such as Prometheus, Splunk, Elasticsearch etc. For example, you can export traffic metrics (such as number of HTTP requests, TCP connections, SSL handshakes) and granular transactional metrics (including request/response latency) from NetScaler to these popular endpoints for centralized reporting and analytics.

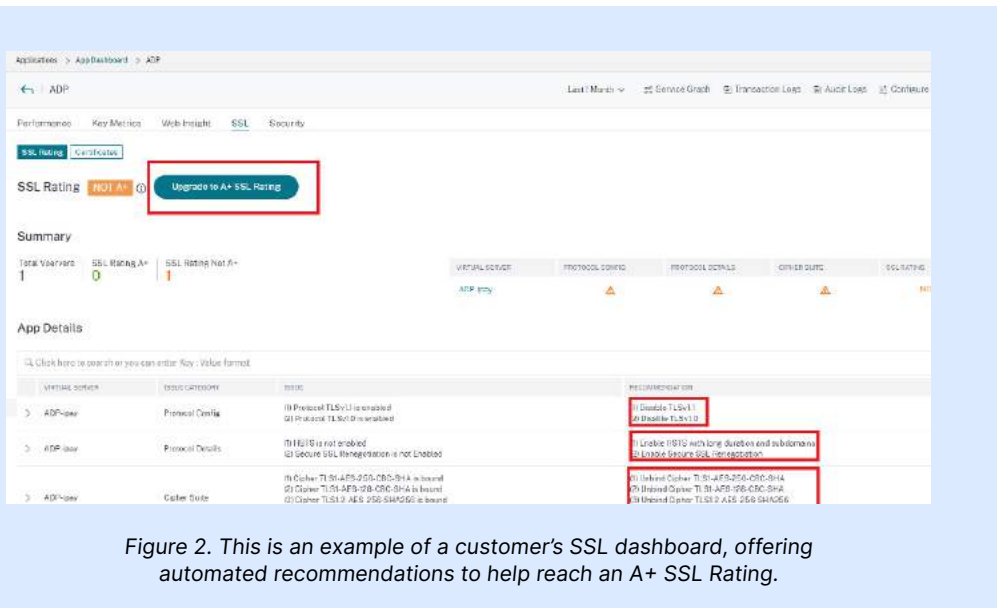


Figure 2. This is an example of a customer's SSL dashboard, offering automated recommendations to help reach an A+ SSL Rating.

Unified deployment and support experience

Deploying TIBCO and NetScaler products together, can provide significant benefits in terms of unified deployment and support, leading to a more streamlined and efficient experience for the customer and better business outcomes. Having a single provider for both products can improve the

coordination and integration between the two components, reducing the risk of compatibility issues and ensuring a smoother deployment with the joint solution as opposed to individual vendors for each layer. Additionally, the simplified communication process during deployment can improve transparency for the customer.

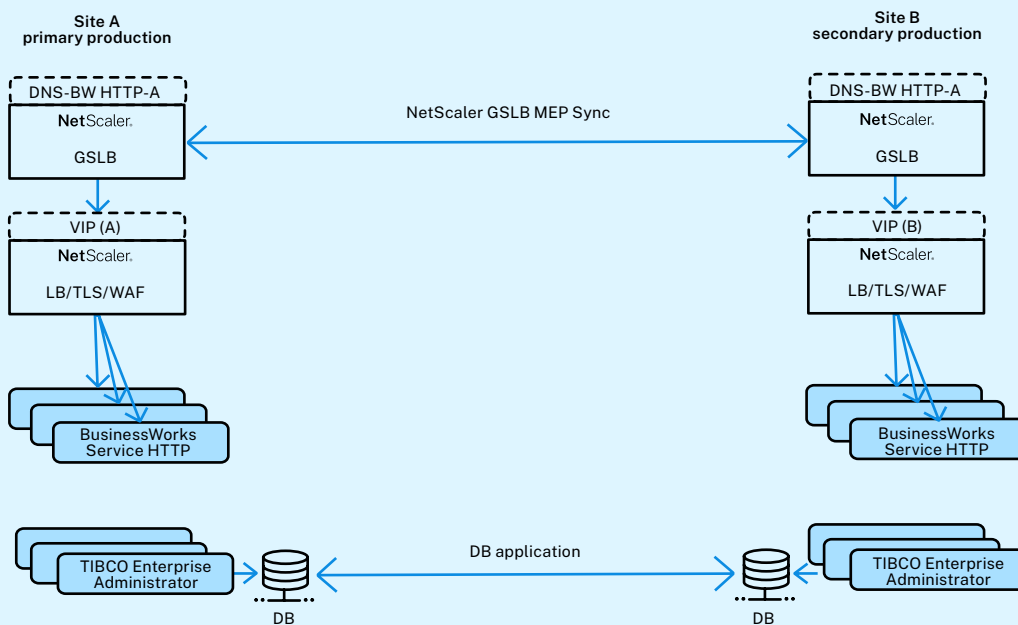
With a unified support experience, customers can receive consistent and seamless support from a single point of contact rather than having to navigate different support channels for each component. This can improve the overall reliability of the system, reduce the risk of prolonged disruptions, and minimize the impact of any issues on the customer’s business operations.

NetScaler and TIBCO have worked together to validate the interoperability of the products and documented those via Validated Reference Designs.

Why use NetScaler for proxying TIBCO BusinessWorks

The key benefits to proxying TIBCO BusinessWorks with NetScaler:

- Improve global & local availability of TIBCO BusinessWorks instances
- Authentication, authorization, API visibility, and API discovery of TIBCO BusinessWorks Apps/APIs/Shadow APIs



	Site A (primary production)	Site B (secondary production)
Normal	DNS-BW HTTP-A, VIP (A)	DNS-BW HTTP-B, VIP (B)
Site A (primary) failure	DNS-BW HTTP-A, VIP (B)	DNS-BW HTTP-B, VIP (B)
Site B (secondary) failure	DNS-BW HTTP-A, VIP (A)	DNS-BW HTTP-B, VIP (A)

Figure 3. This image shows one of the several ways in which NetScaler(s) can be used to achieve the above-mentioned benefits. The architecture shows two identical sites (A & B) deployed in Active-Active mode, with each site hosting multiple TIBCO BusinessWorks & TIBCO Enterprise Administrator instances. Below are details of the use cases that NetScaler fulfills in this architecture.

Global availability

NetScaler performs DNS traffic routing across all sites based on Global Server Load Balancing (GSLB) for TIBCO BusinessWorks instances. In the normal case, users will be directed to a BusinessWorks instance on either Site A or Site B. However, if Site A goes down for some reason, NetScaler will automatically route traffic meant for Site A to Site B, thus eliminating any application downtime. NetScaler instances at each site communicate the state of BusinessWorks instances and will direct requests to the best available site. Application downtime is not only costly for a business but also erodes customer trust. NetScaler GSLB ensures that user, customer, and business requests are always received.

NetScaler Intelligent Traffic Management (ITM) is the industry's leading cloud-managed DNS solution that enables you to centrally control and automate DNS and perform intelligent global server load balancing (GSLB) for hybrid multi-cloud networks. ITM leverages ~8 billion Real User Measurements (RUM) per day, eliminating the complexity, bottlenecks, and scalability limitations of traditional DNS implementations.

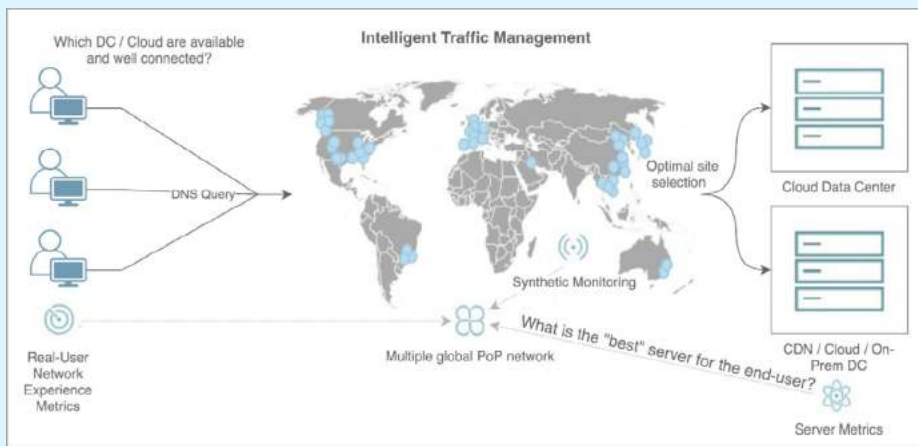


Figure 4. This image shows how ITM leverages server metrics and real user measurement, building a holistic picture of internet health to perform dynamic decision-making, not hard-coded rules that force inefficiencies into your content delivery.

In traditional GSLB deployments, end users in distributed locations connected to the application would use a simple domain name system (DNS) to look up locations. This would involve a list of IP addresses and a simple round-robin distribution of traffic across datacenter locations.

However, there are factors that can affect app performance like physical distance, the number of network devices which have

to be crossed (also referred to as the number of hops), network congestion, and ISP network, which are some of the key parameters that affect the quality of service (QoS). Hence, it becomes critical to use advanced algorithms that use real time data for GSLB decisions for super fast app responses and a great user experience.

ITM can be used to route traffic to the data center hosting TIBCO BusinessWorks instance that is best for a particular user/application based on the above mentioned real time parameters instead of relying on static/traditional methods. For example, ITM can detect when to send traffic to a public cloud site to absorb any burst or spiky load in case of hybrid cloud deployments.

Content-routing, load balancing, and SSL/TLS termination

Deploying a NetScaler improves the reliability of BusinessWorks instances at each site. Users will access the BusinessWorks application through a VIP hosted on NetScaler. NetScaler will inspect incoming traffic and direct it to the right BusinessWorks instance based on multiple parameters and algorithms across the network and

application stack. Further, persistent connections can be assured using hashes of various parameters (IP address, TCP ports, etc.) or using cookies. Cookie injection can be done by NetScaler itself, removing the need to change application code. Most proxies load balance either at connection or request level. Depending on the protocol and service, NetScaler offers granular load balancing based on connection, request, or time-based switching for the most efficient and optimal decisions.

Besides a comprehensive selection of load balancing algorithms and persistence methods, NetScaler further differentiates by supporting

extensive content routing functionality which allows traffic management decisions to be made based on L7 parameters in the request (including headers, URL, query SNI, etc). For example, input requests can be routed to a specific TIBCO BW instance based on device profile (mobile/desktop or Chrome/Safari/Firefox/Edge browser) and similarly cookies can be used to route content relevant for repeat requests. Large enterprise grade customers leverage highly optimized content-routing and load balancing capabilities for

mission critical applications with sub second latency requirements in modern architectures to make decisions based on pattern(s) present in a single or multiple locations within the request to choose the most appropriate server for the content.

NetScaler dynamically discovers the backend service instances in modern application architecture such as microservices. If TIBCO BW instances are deployed as containers or VMs, then NetScaler can dynamically discover these instances and route traffic to the appropriate instance. Additionally, if incoming traffic to TIBCO BW instances is based on advanced protocols such as HTTP2, HTTP3, or TLS1.3, then NetScaler can be used to route traffic based on advanced parameters in these protocols.

NetScaler can act as a full SSL/TLS proxy and offload computationally intensive encryption from BusinessWorks applications while simplifying labor-intensive certificate management. With support for the latest protocols and cipher suites (including TLS 1.3 and PFS ciphers including ECDHE and ECDSA), NetScaler offers the most secure end-to-end application data transfer. A simple SSL offloading setup terminates SSL traffic (HTTPS), decrypts the SSL requests, and forwards clear text (HTTP) traffic to the BusinessWorks instances. NetScaler takes it a step further and can additionally provide end-to-end security by re-encrypting clear text data to the backend BusinessWorks application instance with mutual authentication possible both on the frontend and backend, securing the last mile without compromising on performance or security. NetScaler has industry leading implementation of various SSL functionalities such as mutual-TLS, OCSP client-certificate check for real time check of certificate revocation status, OCSP stapling to reduce handshake time, and session tickets for secure session resumption thereby optimizing SSL performance.

API visibility and security

For REST based APIs and apps integrated with BusinessWorks, NetScaler can provide API Visibility and Security. This capability requires ADM Service (Application Delivery Management Service) in-addition to the NetScaler. The API Analytics feature provides full visibility into APIs, providing information on API usage, performance, and geo location from where the APIs are being accessed. This provides admin a quick way to restrict API access to a selected list of regions or countries. In addition to providing details on the request URI and method, the solution provides insights into the SSL properties including protocol and ciphers used for each API. This enables customers to configure the right SSL properties to cover different clients and achieve Qualys SSL Labs A+ ratings, the

current security gold standard for any web-service using SSL/TLS for transport security.

The API Discovery feature provides a run-time inventory of APIs that are being accessed over a given period. The solution can detect Shadow-APIs and provide a quick and easy way to block such APIs, preventing businesses from unwittingly leaving a backdoor open for bad actors.

Authentication

Authentication enables NetScaler to verify the client's credentials, either locally or with a third-party authentication server, and then allow only approved users to access protected servers. This ensures that backend BusinessWorks instances are spending time working with legitimate requests rather than splitting precious resources dealing with unwanted, unauthorized, and possibly malicious requests. NetScaler supports authentication mechanisms such as OAuth OpenID Connect including OAuth2.0, Basic Authentication, JWT, LDAP, RADIUS, SAML IDP/SP, and Client Certificate Kerberos for access control to your apps' API and web resources.

Why use NetScaler for proxying TIBCO BusinessConnect

NetScaler can also be used to augment availability, resiliency, and security of TIBCO BusinessConnect deployments. NetScaler offers following benefits to TIBCO BusinessConnect customers:

- Improve availability & resiliency of Gateway servers instances
- Improve security posture of TIBCO BusinessConnect

Traffic management

TIBCO BusinessConnect Gateway Server is located in the demilitarized zone (DMZ) outside of the company firewall. It receives B2B communications directly from the Internet and performs SSL validation. Customers typically deploy server instances of Gateway servers to increase capacity of the BusinessConnect application as a whole. NetScaler can be used in front of Gateway servers to load balance traffic across these instances using several algorithms such as round robin, least response time, etc. Further, traffic management decisions can also be based on L7 parameters. For example, requests from TIBCO BusinessConnect trading partners can be routed to specific Gateway servers based on their geographic location, IP address, or other HTTP request headers – allowing for more customization and

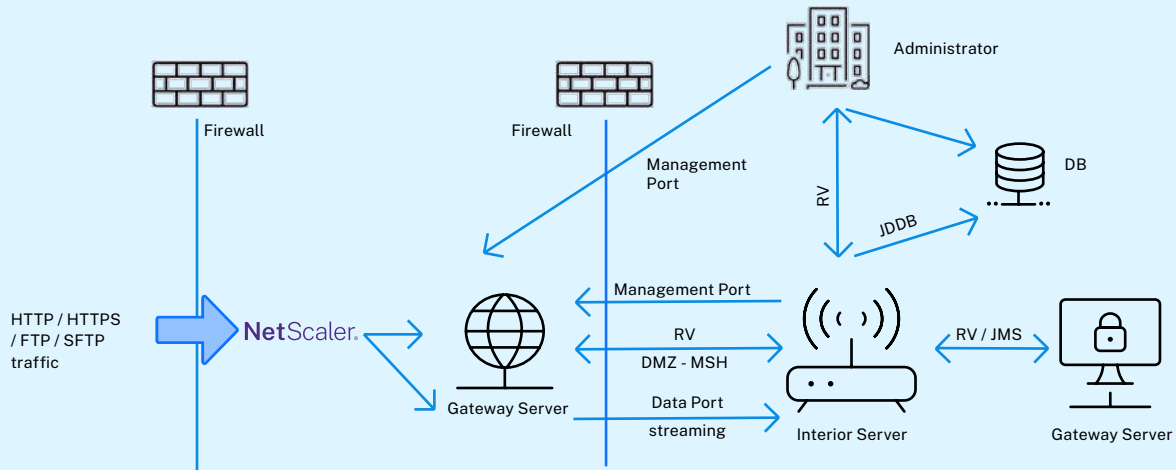


Figure 5. This is an example architecture in which NetScaler can be used in front of TIBCO BusinessConnect Gateway servers. Below are details of the use cases that NetScaler fulfills in this architecture and the corresponding NetScaler features.

specialized benefits for customers. Besides load balancing HTTP/SSL traffic, NetScaler can parse many other TCP/UDP protocols including FTP which results in more optimal load balancing decisions. This is especially useful for Gateway Server deployments terminating HTTP/S traffic, and Gateway Servers can also terminate FTP & SFTP traffic as it receives the inbound transactions from trading partners.

SSL/TLS termination

NetScaler can act as a full SSL proxy and offload computationally intensive encryption from BusinessConnect Gateway servers while simplifying labor-intensive certificate management. With support for the latest protocols and cipher suites (including TLS 1.3 and ECC), NetScaler offers the most secure end-to-end application data transfer. A simple SSL offloading setup terminates SSL traffic (HTTPS), decrypts the SSL requests, and forwards clear text (HTTP) traffic to

the Gateway server instances. In case customers want NetScaler to only perform load balancing and SSL termination on the BusinessConnect Gateway server or BusinessConnect Interior servers, then NetScaler’s SSL bridge capability can be used.

Conclusion

In essence, as a fully featured ADC, NetScaler has the right feature set to ensure TIBCO Business Works & TIBCO BusinessConnect applications are securely delivered and are always available. NetScaler offers the ultimate in choice and flexibility with the broadest array of factors to meet customers’ diverse application deployment needs. And the single code base across all form factors (container, bare metal, virtualized, hardware) provides operational consistency wherever your application is deployed — on-prem, hosted or in any cloud — and enables easy migration between environments.



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