BROCADE

Brocade Services Director for Enterprise

HIGHLIGHTS

- **Scalability:** Create elastic ADC services on demand, which can cluster to massive scale
- **Agility:** Bring new services to market more quickly, adapting capacity to meet demand
- **Management and Control:** Orchestrate Layer 7 services within a virtualized architecture
- **Dramatic Cost Savings:** Optimize resources with enterprise-capacity management and usage model

A New Approach to Application Delivery with the Brocade Services Director

Applications are now the center of the business world. We rely on them to reach customers, build products, automate back-end business processes, and perform almost every task critical to business. A key ingredient for fast, reliable applications is the Application Delivery Controller (ADC). It accelerates transactions, maximizes availability, maintains security policies, and provides a point of control to monitor and manage application traffic.

However, most ADCs on the market today are not designed for large-scale virtual or cloud deployments: their static architectures make them cumbersome and time-consuming to deploy and manage in virtualized and cloud environments.

There is a need for new dynamic architectures that remove bottlenecks and deliver improved agility, high automation levels and faster time to service. At Brocade, we call this new architecture ADC as-a-Service (ADCaaS), which enables you to:

- Cut down provisioning time for ADC services from weeks to minutes

- Provide better user experience with per-application tuning and multi-tenancy

- Deliver better security and performance through isolation and scale

- Right-size your ADCs and save up to 50% in costs, compared to fixed-capacity ADC instances

This new approach to application delivery provides a complete set of tools to deploy services rapidly, wherever and whenever they are needed. ADC instances can be deployed in minutes, rather than weeks, and can be adapted quickly to meet changing workloads and application updates.

- Complete ADC lifecycle management
- Faster-time to service, reducing provisioning times from weeks to minutes
- SDN-ready to support orchestrated rollouts
- ADC automation using REST API
- Right-sized ADCs to reduce overprovisioning
- Reallocate ADC resources to meet changes in workload
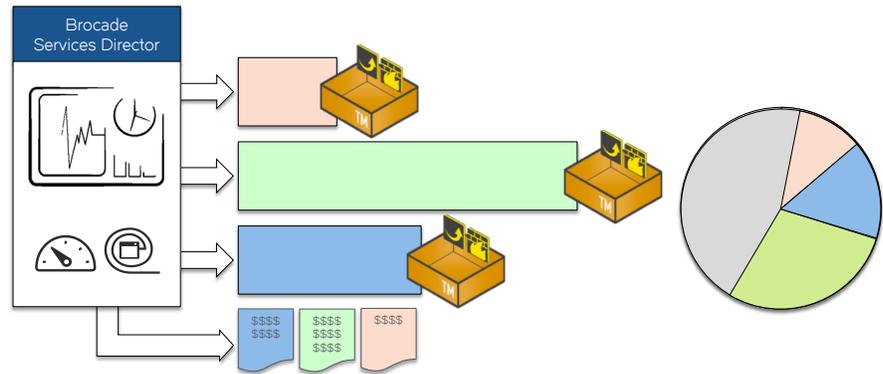- Usage-based business model for improved ROI

Figure 1: The Brocade Services Director.

Brocade Services Director: How It Works

The Brocade® Services Director lets you automatically provision, deploy, license, meter, and manage the inventory of thousands of ADCs in an "as-a-service" model, using the Brocade Virtual Traffic Manager as the core application delivery platform. The solution also enables a new consumption model for customers deploying ADC services. This allows ADC services to be scaled elastically and be right-sized on demand to suit each application in your data center, offering high density, full isolation, and multi-tenancy capabilities.

Provisioning: The Brocade Services Director provisions individual instances of Brocade Virtual Traffic Manager within a hosted virtual environment; alternatively, Services Director can register externally deployed instances within your own data center or hybrid cloud environment.

Licensing: Each instance is licensed automatically, to define the capacity and capability of each instance based on the needs of each application. Brocade Services Director manages the inventory of vADC instances, and ensures that total allocated capacity remains within the overall bulk licensed capacity. This inventory management lets you share the capacity between a number of instances, and reallocate resources to meet changes in demand.

Metering: The Brocade Services Director tracks each instance and creates usage reports for monitoring and billing, and longer-term capacity planning: Enterprises can use this information to cross-charge to each business unit or application owner.

Feature Summary

Flexible and on-demand licensing

Why pay for ADC capacity you don't need or use? The Brocade Services Director takes the guesswork out of sizing application delivery services, so there is no need to pre-purchase ADC capacity in advance. Start small, and add new licensed capacity only when you need it. With this new usage-based business model, you are in control of your costs: you can allocate the charges for internal and external client applications based, for true ADC-as-a-Service.

Enterprise Scalability

The Brocade Services Director can manage the lifecycle of thousands of ADC instances under the same shared resourcing pool. With a high-level view of ADC utilization across your data center and cloud deployments, the Brocade Services Director helps you manage application delivery services across all your applications with a common resource model.

Agile ADC provisioning

Deploy application delivery services in minutes, and exactly where needed to reduce time to market for new applications and services. Create new ADC instances on a per-application or per-tenant basis instantly, start and stop instances for service migration, and even pre-provision ADC instances for even faster "instant-on" services.

High-density multi-tenancy and isolation

With the Brocade Services Director, you can right-size and scale in multi-tenant environments, while maintaining isolation on a per-application or per-tenant basis. This reduces "noisy neighbor" performance concerns, while maximizing ADC utilization and investment. In addition, this service isolation makes it easy to perform upgrades without impacting adjacent applications.

Lightweight ADC services

With support for a range of deployment options, the Brocade Services Director can deploy lightweight ADC services within a managed host environment. Alternatively, Services Director can license and monitor externally deployed ADC services and clusters for large-scale applications, giving complete elasticity in either a shared-services or a distributed deployment model.

Automated service metering

The Brocade Services Director maintains a database of all ADC instances, and the license allocated to each ADC. Services Director also maintains an audit trail of which ADC services have been deployed, and records the throughput and peak data rate of each ADC instance, and provides integrated billing records that enable you to charge back to individual client applications.

RELIABLE SUPPORT OPTIONS

- Brocade Essential Support
- Provides 24×7 access to Brocade Technical Support expertise, reducing time to resolution
- Provides unmatched expertise in data center networking to optimize network performance
- Simplifies management through online technical support tools

Reallocate resources to match demand

Because Brocade Services Director keeps track of the ADC resources used, and the actual throughput used by each application, it is easy to re-allocate the resources to meet changes in workload. As the needs of your applications change through seasonal or periodic cycles, you can re-assign the application delivery resources to match the workload: no need to purchase extra capacity unless the total usage exceeds the overall licensed capacity.

Open APIs

The Brocade Services Director integrates directly into your network and service provisioning systems with a powerful REST-based API. Services Director can register an externally managed instance of Brocade Virtual Traffic Manager; or alternatively, Services Director can build a complete, dedicated ADC on demand with unique name, control ports, admin credentials, and a license key, ready to be configured to suit the needs of the application. In both cases, Brocade Services Director manages each ADC instance via the standard RESTful API for Brocade Virtual Traffic Manager.
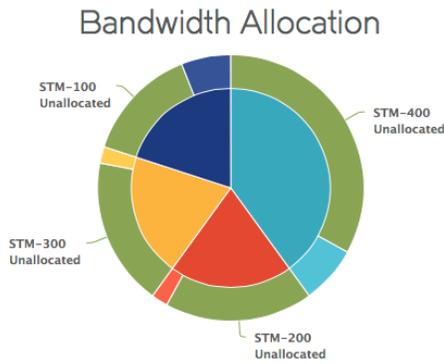

Figure 2: Bandwidth Allocation

Reporting and Service Visibility

The Brocade Services Director includes a comprehensive suite of reports that provide intuitive point-in-time information on utilization for service resources.

These reports gather metrics from Traffic Managers registered with the Services Director, and presents via the Services Director graphical console for review and capacity planning:

Traffic Manager Status Report: Summary of all Traffic Manager instances managed by Services Director, grouped by feature packs and by status. The chart is interactive, to allow drill-down into individual feature-pack or hosts.

CPU Utilization Report: Detailed review of CPU utilization and aggregated throughput data on per host basis for all instances managed by Services Director. In order to scale the report for large deployments, regex filters are supported on instance names.

Throughput Utilization Report: Display the overall utilization of managed and externally deployed ADC instances, both incoming and outgoing data throughput. The data is aggregated on a per-host basis with regex filters allowed on instance names.

Bandwidth Allocation Report: Snapshot of current bandwidth allocation, grouped both by type of instance, and by type of license. As with the other reports, the chart is interactive, so you can drill down on the chart to analyze capacity available per-license.
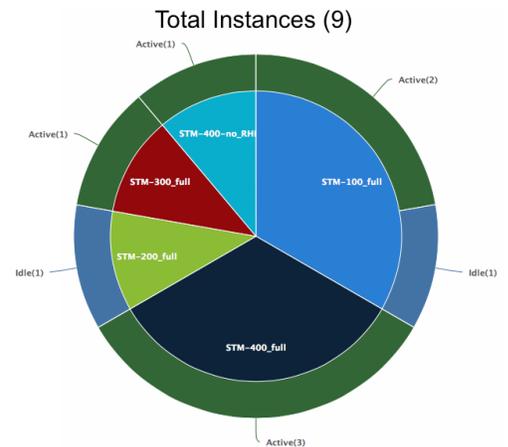

Figure 3: Total Instances.

Enterprise Licensing

The Brocade Services Director introduces a different approach for license key management for your application delivery controllers. Brocade Services Director manages the complete lifecycle of Brocade vADC products:

- Deployment
- Licensing
- Metering
- Inventory management
- Performance monitoring

The Brocade Services Director keeps track of the overall bandwidth capacity and allows the capacity to be dynamically reallocated to suit workload requirements. There is no fixed limit to the number of instances that can be deployed within the overall licensing pool.

This new innovation in the ADC market allows for on-demand, right-sizing of your vADCs that results in OPEX savings through automated actions by the Brocade Services Director. This results in a much more flexible licensing model. To achieve this, Brocade Services Director is required to maintain licensing information about each product under its control, in addition to its own license.

Service Provider Licensing

A different licensing model is available for organisations who wish to resell application delivery services using Brocade Services Director. These organizations, termed Cloud Service Providers by Brocade, are subject to a separate Service Provider agreement and licensing model. For more information, please contact your account manager for details.

Bandwidth Packs

The Brocade Services Director introduces the concept of Bandwidth Packs, providing a pool of deployable bandwidth. Each Base Bandwidth Pack adds to this pool, and each deployed instance reserves a portion of it for its own exclusive use. Each bandwidth pack must be associated with a specific Services Director license and can be used in a cluster of Services Directors. If the Services Director fails, the bandwidth packs associated with the director remains valid as long as the cluster is still available. Any combination of Traffic Manager sizes may be deployed. The only limit is the total deployable throughput capacity as defined by the Bandwidth Packs purchased. This means you can draw an unlimited number of Traffic Manager instances, subject to the overall licensed bandwidth limits.

Add-On Packs

In addition to the standard base Bandwidth Pack you have the option to purchase additional features.

The following optional features require Add-on Bandwidth Packs to be purchased:

- FIPS
- Virtual Web Application Firewall: (vWAF)
- Web Accelerator

You can create similar pools using Add-On Bandwidth Packs. These pools are drawn down, in the same way as the Base Bandwidth Packs. Brocade offers you flexibility, there is no requirement to purchase the same capacity of add-on packs as base packs, and you assign add-on capabilities such as vWAF only to those Traffic Manager instances that need it.

For example, imagine that you have purchased 20 Gbps of base throughput (split equally between standard and enterprise functionality) and 5 Gbps of vWAF add-on. Three Brocade Virtual Traffic Managers have been deployed:

- 3 Gbps standard Brocade Virtual Traffic Manager
- 3 Gbps enterprise Brocade Virtual Traffic Manager with vWAF
- 2 Gbps standard Brocade Virtual Traffic Manager with vWAF

The vWAF pool is now exhausted, no further deployments can include this additional feature, but there is plenty of capacity left for deployment of standard and enterprise-level ADCs.
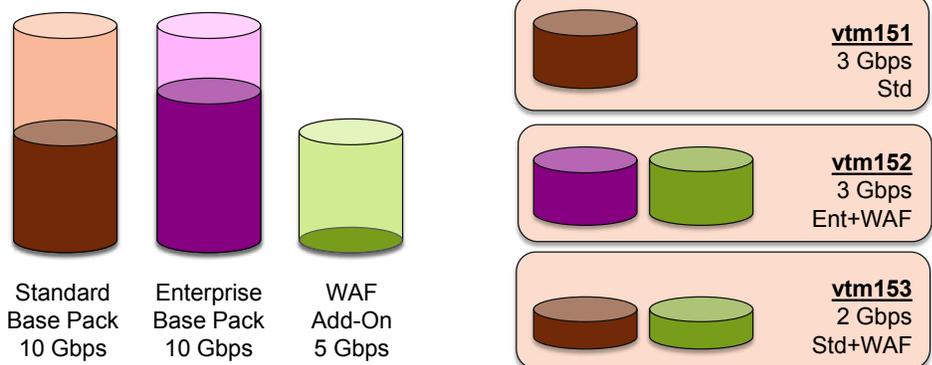

Figure 4: License Packs Shared Across Three vTM Instances.

Brocade Virtual Traffic Manager: Bandwidth Pack Function Matrix

Services Director vTM Edition	STM-B-200 Basic	STM-B-300 Standard	STM-B-400 Enterprise
Management Interfaces	Web-based GUI, REST, SOAP, CLI	Web-based GUI, REST, SOAP, CLI	Web-based GUI, REST, SOAP, CLI
Cluster Size	Up to 64 nodes in each vTM cluster	Up to 64 nodes in each vTM cluster	Up to 64 nodes in each vTM cluster
Graphical Analytics	Y	Y	Y
IPv6 Support	Y	Y	Y
Layer-7 Load Balancing	Y	Y	Y
Content Routing	Y	Y	Y
Health Monitoring	Y	Y	Y
Session Persistence	Y	Y	Y
Rule Builder	Y	Y	Y
SSL/TLS Offload	Y	Y	Y
HTTP Compression	Y	Y	Y
Event and Action System	Y	Y	Y
Service Protection	Y	Y	Y
Analytics		Y	Y
Traffic Script		Y	Y
Advanced Session Persistence		Y	Y
HTTP Caching		Y	Y
Application Autoscaling		Y	Y
Java Extensions		Y	Y
XML Parsing		Y	Y
Bandwidth Management		Y	Y
Rate Shaping		Y	Y
Service Level Monitoring		Y	Y
Multi Site Manager		Y	Y
Global Load Balancing			Y
Kerberos Constrained Delegation			Y
Route Health Injection			Y
Attach FIPS	OPT	OPT	OPT
Attach vWAF		OPT	OPT
Attach Web Accelerator		OPT	OPT

Additional Licensing Notes for the Brocade Services Director

Licensing Note	Description
Production License Keys	Production Services Director licenses and bandwidth packs may be used for Production Traffic, so long as bandwidth packs are used exclusively with the associated Services Director license. However, vADC services may not be directly resold to any third party without the appropriate cloud service provider license, contact Brocade for more information. All licenses are subject to the Brocade End User License Agreement.
Evaluation License Keys	A evaluation or trial of Brocade Services Director requires a Services Director license key, and Bandwidth Packs for Traffic Manager and any additional Feature Packs. Evaluation license keys may not be used to process production traffic.
Perpetual Licenses	Perpetual licenses provide a perpetual (non-expiring) license key that may be used up to the licensed limit. Support and software upgrades are not included with a perpetual license. This can be obtained by paying an annual support fee.
Subscription Licenses	Subscription licenses allows the software to be used for a period of time (the "term") and requires payment of a subscription fee up front for that term. Subscription licenses include support and maintenance for the duration of the subscription.
High Availablity	The Brocade Services Director can be deployed to give high availability. Brocade recommends that all Bandwidth Packs are associated with the license key of a single Services Director in the cluster. If that Services Director is temporarily unavailable, an associated Bandwidth Pack will continue to be valid as long as the Services Director Is a member of the cluster.
Latency Requirements	When all features are required (deployment, metering, monitoring), Brocade Services Director needs network links with a link latency of 10ms or less and bandwidth of 100 Mbps or greater to support scales up to 5000 instances.
	When used purely for instance licensing (i.e. licensing externally deployed instances), Services Director needs network links with latency of 400 ms or less to support scales up to 5000 instances.
Grace Period	Licensed Traffic Managers will enter a 'Grace Period' if the Brocade Services Director becomes temporarily unreachable. If licensed Traffic Manager instances are stopped and restarted (e.g. due to a failure) while no Services Directors are running, the restarted instances will enter a "grace period" until a Service Director becomes available for licensing. It is recommended that Services Director is deployed in a HA cluster arrangement to avoid this situation. If instances remain running while no Services Directors are available for licensing, they enter the grace period (normally six weeks) and maintain their licensed features until that grace period expires, after which they become unlicensed (and fall back to developer mode).
Developer Mode Instances	If a Traffic Manager instance does not have a valid license key, then it will start in "Developer mode." However, note that Developer mode is not available for Traffic Managers which are being managed by Services Director, and there is no developer mode for Services Director itself.
	Developer mode Traffic Manager instances can be deployed independently, without assistance from Services Director. Alternatively, low-capacity instances of Traffic Manager use the granularity offered by Services Director can provision a low-capacity instance to suit the test environment. A single 5 Gbps Bandwidth Pack for Services Director can be used to provision up to 5,000 independent Traffic Managers, sized at 1 Mbps each.
Performance Limits	The maximum capacity of each Traffic Manager is set at deployment time, and Services Director can be used to modify the performance of each Traffic Manager at any time. The performance rating applies to outgoing bandwidth (in all directions), after content compression. Traffic Manager instances managed by Services Director are unrestricted in SSL performance, up to the deployed bandwidth.
	Connections will not be dropped unless outbound traffic greatly exceeds the bandwidth capacity for a sustained period of time, when no data can be transmitted before the client or server timeouts expire.
	The host hardware must be adequately specified in order to deliver the desired performance.
Expired Licenses	Perpetual licenses do not expire. Other licenses issued by Brocade will have an expiration date. Once a Bandwidth Pack's expiration date has passed, there must be sufficient capacity in the remaining bandwidth packs to service all deployed instances. If there is not, all instances will drop into unlicensed mode.
	Other zero-cost licenses issued by Brocade for non-production use can continue to be used at no cost unless Brocade has terminated the relevant license of developer program.

Brocade Services Director for Enterprise Specifications

Brocade Services Director Virtual Appliance

Hypervisor	VMware vSphere ESXi 5.0+
Recommended CPU	4 vCPUs
Recommended memory	8 GB
Recommended disk space	46 GB (plus additional disk space for metering logs, depending on number of instances metered)

Brocade Services Director Software

Operating system	Ubuntu 12.04 (x86_64) Ubuntu 14.04 (x86_64) CentOS 6.5 (x86_64)
Database	MySQL 5.5 (5.5.32 recommended)
Other services	SMTP
Recommended CPU	Intel Xeon / AMD Opteron
Recommended memory	2 GB
Recommended disk space	10 GB (plus additional disk space for metering logs depending on the number of instances metered)
Additional Note:	Software-only installation is recommended for fully automated environments, which do not require a GUI or console

Virtual Environment

Instance Host VA	Small	Large
Hypervisor	VMware vSphere ESXi 5.0+	
Recommended CPU	2 vCPUs	8 vCPUs
Recommended memory	4 GB	16 GB
Recommended disk space	70 GB	70 GB

Software/Virtual Environment: Brocade Virtual Traffic Manager managed by the Brocade Services Director

OS supported for managed vTM instances	Ubuntu 12.04 (x86_64) Ubuntu 14.04 (x86_64) CentOS 6.5 (x86_64)
OS supported for externally managed vTM instances	Other operating systems are supported for externally managed instances. See the Brocade Virtual Traffic Manager data sheet for details (requires Brocade Virtual Traffic Manager 9.5 or above).

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