ByteMobile Virtual Adaptive Traffic Management Solution

An integrated platform for video and web optimization, analytics, policy control, and deep packet inspection (DPI), to dynamically adapt to changing network conditions and ensure that mobile subscribers have the best user experience possible.

The ByteMobile® Adaptive Traffic Management (ATM) solution, leverages various applications including deep packet inspection (DPI), analytics, subscriber engagement, policy control functionality, video, web, Internet radio, TCP optimization and caching to dynamically adapt to changing network conditions and ensure that mobile subscribers have the best user experience and open up monetization opportunities for the operator.

The path towards virtualization of the ATM solution that started with the virtualizing the ByteMobile Reporting Dashboard and the ByteMobile Element Manager have evolved to include the ByteMobile Adaptive Traffic Manager. Starting with software release 7.1 of the ATM solution, Citrix® now offers operators the option to deploy the ByteMobile Adaptive Traffic Manager in a virtualized environment in addition to the existing appliance model option, which has been deployed widely across all geographies. Our virtualization plans will continue to evolve going forward to meet our customer expectations and needs.

**Benefits**
- Feature equivalence with appliance model
- Hypervisor and orchestration system agnostic
- Increased operational flexibility
- Hardware independent
- Industry leading virtual system performance

![Figure 1: Adaptive Traffic Management: Appliance and virtual deployment options](image-url)
The ByteMobile virtualized ATM solution incorporates all solution elements and functions namely:

- ByteMobile Virtual Adaptive Traffic Manager (vATM): The ByteMobile virtual Adaptive Traffic Manager is the cornerstone of the ByteMobile Adaptive Traffic Management Solution. As the central “brain” for Adaptive Traffic Management, the vATM leverages ByteMobile applications and integrates deep packet inspection (DPI), video, web and Internet radio optimization, analytics and policy control to dynamically adapt to changing network conditions and ensure mobile subscribers have the best user experience possible.

The vATM incorporates the ByteMobile orchestration system, allowing the vATM to act as a single network element for the system capabilities and applications. This eliminates the cost and complexity of deploying and managing multiple network elements from different vendors for traffic management. Acting as an intelligent, content-aware control point between the Internet and the mobile network, vATM improves the utilization and performance of existing mobile network capacity by up to 50%.
• **ByteMobile Virtual Traffic Director:** The virtual Traffic Director steers traffic and manages load for the vATM and other solution elements on the data plane, control plane and application plane. The virtual Traffic Director facilitates network integration and intelligently maintains high availability for applications running on the vATM. The virtual Traffic Director offers deployment flexibility to rapidly insert ATM solution applications to control subscriber mobile data traffic.

• **ByteMobile Virtual Reporting Dashboard:** The ByteMobile Reporting Dashboard provides operators with a consolidated summary of mobile data trends and optimization performance across multiple sites where Adaptive Traffic Solutions are deployed. Designed to help operators measure, at a content level, the impact of different traffic types, device types, video formats and network performance, the Reporting Dashboard is vital in planning, managing and maintaining mobile data networks for maximum performance, efficiency and subscriber quality of experience.

The Reporting Dashboard can be accessed remotely through any standard web browser, offering operators an intuitive and easy to use tool for understanding mobile network performance and the precise impact of data optimization. Operators can view network information across multiple geographies and deployments, comparing and benchmarking the effects of optimization on network efficiency and subscriber quality of experience.
• **ByteMobile Virtual Element Manager:** The ByteMobile Element Manager enables mobile operators to rapidly deploy, manage and operate multiple ByteMobile network elements supporting the Adaptive Traffic Management Solution. It supports fault, configuration, accounting, performance, security (FCAPS) the ISO Telecommunications Management Network model and framework for network management. The Element Manager is a server application with a web-based graphical user interface (GUI) that simplifies control, configuration, maintenance and upgrades of the ByteMobile Adaptive Traffic Management solutions. The result is reduced operational complexity and lower overall cost.

![ByteMobile Element Manager](image)

Figure 5. ByteMobile Element Manager

Together, these four ByteMobile virtual functions encompass a range of functionality that helps network operators effectively address the traffic challenges and revenue opportunities of the mobile data revolution.

The virtualized deployment options for the ByteMobile Video Cache and the ByteMobile Data Loader are expected to be offered in a future ATM software release.

### Specifications

**Performance**

Virtual ATM is expected to have up to 90% of the performance when compared to bare metal performance on similar hardware. The mix of traffic and the optimization performed determines the relative performance when compared to bare metal performance.
Minimum Hardware Requirements

vATM requires two different OVA images for different virtual functions, vASM and vCSM. Operators can use any hardware that meets, specified memory, microprocessor cores, SSD storage and virtual NICs:

**vASM Hardware Requirements**

- Dual Intel Xeon 5645 6 core processors
- 48G RAM
- 4 x 1GE NIC

**vCSM Hardware Requirements**

- Dual Intel Xeon 5645 6 core processors
- 48G RAM
- 400GB SSD
- 4 x 1GE NIC

**Hypervisor**

- VMWare ESXi 5.5