



# Operator Drives Bandwidth Efficiency and Optimizes Satellite Link Performance

Using Cisco® onePK, EMC integrates ACM in Cisco ISRs to increase bandwidth efficiency and optimize performance.

“With the programmable APIs in Cisco onePK, we were able to develop network applications that enable EMC to more efficiently utilize our satellite resources. Feedback of service-related parameters from the SatLink platform to the upstream Cisco ISR helps our network to proactively adapt to link changes.”

- Shadrach Benny Retnamony, Director of Advanced Engineering, EMC

## Challenges

- Optimize bandwidth capacity utilization
- Improve processes for monitoring and adjusting bandwidth capacity for each customer with an automated solution
- Provide more competitive pricing

Providing network connectivity and services, such as data, voice, live TV, high-definition (HD) on-demand video, and mobile services, EMC caters to customers with operations in some of the most remote corners of the planet. Managing satellite bandwidth requires sophisticated monitoring tools to ensure consistent performance of voice, video and data during events, such as rain, that can affect the quality. This telecommunications leader prides itself on delivering carrier-class services through its global mobility platform, using its hybrid satellite and terrestrial broadband network.

The EMC network features fully meshed, Multiprotocol Label Switching (MPLS) enabled and interconnected teleports in the United States, Europe, South America, Africa, and Asia. With EMC’s proprietary tools, it can manage and optimize every megabyte delivered. Its customer-facing tools further maximize every bit delivered over each customer’s WAN and LAN.



## Case Study | EMC

Size: 500+ Employees worldwide

Location: Miami, Florida, USA

Industry: Service Provider



"In order to meet the quality of service requirements of our customers and partner's applications, we relied on the router capabilities," says Shadrach Benny Retnamony, Director of Advanced Engineering at EMC. "However, we needed a method to provide information on the quality of the link from the satellite platform to the upstream MPLS network, for additional efficiency."

Operating a network based on Cisco technology since its founding, EMC turned to Cisco to jointly develop a more efficient, proactive, and cost-efficient alternative to manage satellite bandwidth monitoring and troubleshooting that would provide greater automation and consistent quality of service (QoS).

EMC is continuously seeking the best technologies available in the market to provide top quality services to our customers.

### Solutions

- Cisco onePK was used to design an application to send back adaptive coding and modulation (ACM) information from the satellite link
- Cisco hierarchical QoS (HQoS) and class-based QoS (CBQoS) extend the benefits to multiple services per router and apply monitoring to individual service queues

## Adaptive Coding and Modulation Integration with Cisco HQoS Increases Service Availability

Cisco collaborated with EMC to use Cisco One Platform Kit (onePK) for Developers—a toolkit that provides network programmability through open APIs on Cisco routers and switches—to implement ACM information feedback from EMC's SatLink hubs as part of an evolved programmable network. ACM is a technique that increases service availability and satellite link efficiency by matching modulation, coding, and other signal and protocol parameters to satellite link conditions. With ACM in place, should a customer experience increased latency or jitter due to adverse weather conditions, interference, or other satellite impairments, ACM can automatically detect the problem and correct data rates instantaneously.

## Adding New Intelligence to the Satellite Handoff to Cisco Routers

With the ACM Cisco HQoS application, a closed-loop feedback of link state information is exchanged between EMC SatLink hub and upstream Cisco Integrated Services Router (ISR) G2 2900 Series Routers. Modulation and forward-error correction (FEC) are dynamically adjusted to maintain a high QoS. The SatLink ACM operation is integrated with the Cisco HQoS feature in the routers, which allows QoS for different services running on the same routers to adapt to link changes. Consequently, service quality of mission-critical applications isn't affected even under dynamic adverse weather conditions and local interference. Under normal conditions, ACM integration with HQoS provides increased network capacity and bits-per-Hz link spectral efficiency. Along with the CBQoS monitoring feature, which monitors individual service queues based on service classes, EMC has more robust end-to-end application visibility and control that adapts to dynamic changes in bandwidth.





**Results**

- Increased service availability and bit-per-Hz link spectral efficiency
- Enlarged total network capacity
- Improved automation in operational processes required of network administrators
- Enhanced ability to exceed customer service-level agreements (SLAs) for QoS in multiple types of traffic

### Increased Efficiency in Managing Satellite Networks

The ACM QoS project adds programmable automation to the EMC network environment, relieving network administrators of manual monitoring and bandwidth distribution tasks.

“By using this feature, our engineers have more time to focus on adding value for our customers, thereby enhancing the quality of services, says Federico Fawzi, EMC vice president of Engineering and Infrastructure.

EMC also expects fewer customer support calls to the network operations center (NOC) and increased levels of customer satisfaction. The company can focus more engineers on the development of new services instead of monitoring and fixing network capacity problems.

Better service. More efficiency. Automation. Higher quality of service. It’s not often that one technology solution provides so many different benefits. But that’s exactly the case at EMC with ACM QoS and a programmable network. More efficient satellite monitoring and utilization set the stage for the company’s aggressive marketing efforts to expand its business among oceangoing customers and the vast opportunities in the emerging markets of Africa, Asia, and the Middle East.

### For More Information

To find out more about Cisco onePK for Developers and applications, such as ACM, visit <http://cs.co/onePK-AAG>.

To learn more about the Cisco Evolved Programmable Network (EPN) for service providers, visit: [www.cisco.com/go/eptn](http://www.cisco.com/go/eptn).

**Products & Services**

<p><b>Routing and Switching</b></p> <ul style="list-style-type: none"> <li>• Cisco 3900 Series Integrated Services Routers</li> <li>• Cisco 2900 Series Integrated Services Routers</li> </ul>	<ul style="list-style-type: none"> <li>• Cisco ASR 1000 Series Aggregation Services Routers</li> </ul>
	<p><b>Networking Software</b></p> <ul style="list-style-type: none"> <li>• Cisco One Platform Kit (onePK) for Developers</li> </ul>



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