How Cisco IT Increased SAS PM Performance While Decreasing Costs with Cisco UCS B440 Server

Migrating Application from HP Mid-Range Servers to Cisco UCS B440 Blade Server Reduced Daily Processing Time from 180 to 50 Minutes and Lowered Costs

Cisco IT Case Study / Data Center / SAS PM Migration from Mid-Range HP-UX Servers to Cisco Unified Computing System: Cisco finance teams use a decision-support system called the Allocation Engine to understand profitability by associating costs and revenues with business segments. The SAS Profitability Management (PM) component of the Allocation Engine previously operated on an HP Integrity rx8640 system, which had inadequate memory to process 30 million records by the early morning deadline. Cisco IT accelerated cost-based allocations from 180 to 50 minutes by migrating the SAS environment to the Cisco Unified Computing System, taking advantage of its much higher RAM capacity. SAS PM performs almost 200 percent faster on the new platform. Now Cisco IT can more easily meet the service-level agreement (SLA), and will even be able to provide more granular allocations within the same timeframe. Cisco customers can draw on Cisco IT's real-world experience to determine if moving their SAS PM applications to the Cisco Unified Computing System would provide value in their environment.

> "Since moving the SAS Profitability Management to the Cisco Unified Computing System, we not only can meet our SLA to publish allocated data to the reporting system by 9:00 a.m., we're actually beating the SLA time by up to two hours."
>
> **Deepak Maganti, Cisco IT Project Manager**

Challenge

Cisco uses the Allocation Engine application for agile allocation of costs and revenues, supporting the company's dynamic business models. Allocating costs and revenues to the lowest level of organizational hierarchies increases the value of the information for decision-making. "Finance teams use the information from the Allocation Engine for investor-relations schedules, profit and loss reporting, business reviews, contribution-margin reporting, and other financial reporting," says Deepak Maganti, Cisco IT project manager for the Allocation Engine.

To develop the Allocation Engine, Cisco IT integrated SAS PM with other financial systems that retrieve data from multiple sources and process the data. Each day, the Allocation Engine sends the allocated data to a reporting system that provides different views for Cisco analysts, managers, controllers, directors, and others.

Growing data volume and more data sources made it increasingly difficult to meet the 9:00 a.m. deadline to refresh the reporting information. Reports were delayed by as much as three hours at month-end, when volume was highest. "Delays in SAS PM processing impeded timely decision-making during the critical days leading to quarter-end close," says Maganti.

The delays resulted from inadequate shared memory in the previous server. "SAS processes execute very quickly in memory," says Sivakumar Padmanabhan, IT architect for Cisco IT. "But when memory is insufficient, SAS software initiates more disk input and output operations, slowing performance." The SAS Institute confirms that when results and associated data are held in shared memory, requests for new scenarios or additional computations execute more

quickly.[1]

The need to accelerate SAS PM performance became more urgent when Cisco finance teams began asking to see profitability not just by product family, but also by individual product. Cisco has 1.6 million individual products. Reporting this level of detail would increase the volume of records that SAS needed to process by more than 300 percent, from 30 million to 100 million records.

To continue meeting the 9:00 a.m. SLA, Cisco IT needed to migrate the SAS to a computing system with more on-board memory, without increasing data center space, power, and cooling requirements.

Solution

Cisco IT significantly accelerated the SAS PM component of the Allocation Engine performance by migrating it from an HP Integrity rx8640 system to a Cisco UCS B440 Blade Server with 256 GB of RAM.

"The migration was very straightforward," says Kalyani Komarasetti, SAS developer for Cisco IT. "We had no issues moving the data from HP-UX to Red Hat Linux." The SAS development team within Cisco IT can now use existing skill sets and standard operational and maintenance practices to administer the operating system or fine-tune the application.

The SAS PM application required no modifications to continue connecting to all upstream and downstream financial systems. Cisco IT simply ported over the security settings and access controls from the HP server.

Results

Faster Processing to Help Meet SLA

"Since moving SAS PM to the Cisco Unified Computing System, we not only can meet our SLA to publish allocated data to the reporting system by 9:00 a.m., we're actually beating the SLA time by up to two hours," says Maganti.

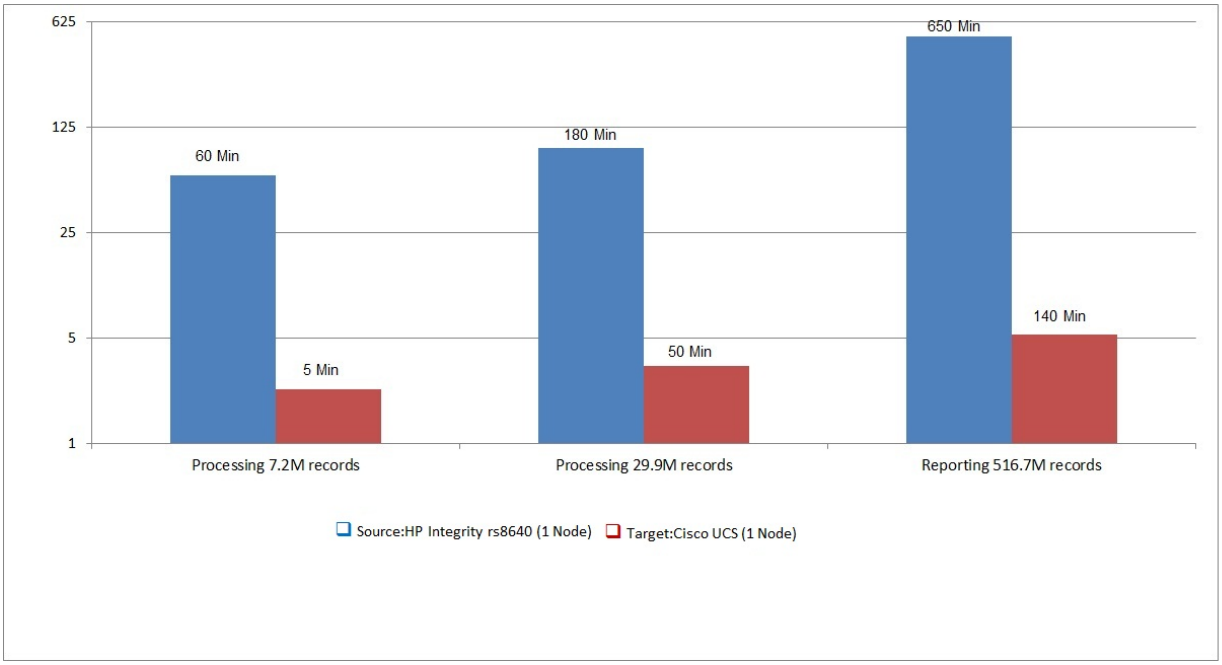
Moving the SAS from the HP-UX server to Cisco Unified Computing System accelerated the following processes, as shown in Figure 1:

- Preprocessing: from 60 to 5 minutes
- Costs and revenues allocation: from 180 to 50 minutes
- Reporting: from 650 to 140 minutes, or 8.5 hours

"Saving 130 minutes on processing time for cost and revenue allocation had the biggest impact in helping us continue meeting the SLA," Maganti says.

[1] http://www.sas.com/software/high-performance-computing/in-memory-analytics/

Figure 1. Faster SAS Processing on the Cisco UCS B440 Blade Server



On the HP Integrity server, the SAS preprocessing step required more than 5 million time-consuming block disk input/output operations, compared to none on the Cisco Unified Computing System. Likewise, the processing step required 20 million block I/O operations and 17 million block I/O operations on the HP server, and none on Cisco Unified Computing System. “Eliminating disk input/output operations significantly increased our SAS application performance,” Maganti says.

Faster SAS performance will also enable Cisco IT to confidently allocate costs and revenues by individual product in addition to product family, while still meeting the SLA to publish data to the reporting system by 9:00 a.m.

Lower Operational Costs

In addition to accelerating application performance, migrating SAS PM from the HP server to the Cisco Unified Computing System lowered operational costs:

- **Reduced data center space, power, and cooling requirements:** Table 1 compares the SAS PM environment before and after the migration.
- **Simplified connectivity:** The Cisco UCS B440 Blade Server used for SAS PM can share a chassis with other blade servers hosting other applications. All servers in a chassis connect to the data network and to storage through a single pair of Cisco UCS 6100 Series Fabric Interconnects.
- **Lower management costs:** The system administrator can support far more x86/Linux servers than HP-UX servers. In addition, Red Hat Certified Engineers are more widely available.

Table 1 Lower Operational Costs on Cisco UCS B440 Blade Server

	Source (HP rx8640)	Target (Cisco UCS B440)
Server Configuration	▪ Production: 16-core processor with 56GB RAM ▪ Staging: 16-core processor with 56GB RAM ▪ Development: 4-core processor (Integrity rx6600) with 32GB RAM	▪ Production: 32-core processor with 256GB RAM ▪ Staging: 32-core processor with 256GB RAM ▪ Development: 8-core processor (Cisco UCS B200) with 96GB RAM
Space	1-1/2 racks	1/7 rack: Each blade occupies only 2-1/2 slots in a single 6-RU Cisco UCS chassis. The chassis has room for three additional blades used for other applications.
Power	5.5 kW	3.5 kW
LAN and SAN Interfaces	▪ Production: 1 management, 4 HBA, 2 NIC ▪ Staging: 1 management, 4 HBA, 2 NIC ▪ Development: 1 management, 2 HBA, 2 NIC	Production: 2 CNA Staging: 2 CNA Development: 1 CNA

Lower Capital Costs

The Cisco Unified Computing System cost less than 10 percent of the HP-UX server it replaced. One reason is less expensive memory. “On the Cisco UCS B440 Blade Server, we could provide 256GB of RAM using 8GB DIMMs operating at full speed, or 1067 MHz,” says Maganti. “This is more cost-effective than our HP server’s memory footprint, which was 56GB using 2GB DIMMs operating at 133 MHz.”

Cisco IT deployed the three blade servers used for production, staging, and development in existing Cisco UCS chassis. Cabling costs for these chassis are approximately 40 percent less than for other server platforms that Cisco IT used previously.

Increased Resilience

If the Cisco UCS 440 Blade Server should fail, Cisco IT can rapidly provision any other available blade by applying a Cisco UCS Manager service profile with a few clicks. The service profile contains the fully abstracted identity of the failed system, helping restore the service much more quickly than possible with the previous system.

Lessons Learned

Cisco IT conducted tests demonstrating that the higher the SAS data volume, the greater the performance gains from migrating from the HP server to the Cisco UCS B440 Server. Cisco IT experienced significant gains with 1 million records, and even more with 30 million records.

The Cisco IT team suggests implementing the maximum available amount of RAM on the Cisco Unified Computing System. “Enabling SAS to process everything in memory optimizes performance,” says Komarasetti.

For More Information

To read additional Cisco IT case studies on a variety of business solutions, visit Cisco on Cisco: Inside Cisco IT www.cisco.com/go/ciscoit

To read more about Cisco Unified Computing System, visit www.cisco.com/go/unifiedcomputing

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