

Suncoast Oracle Users Group

EMC DB Classify

EMC Plug-in for OEM

August 27, 2013

Mike Greenleaf – EMC System Engineer

Agenda

- Introduction— 5 min
- Overview of EMC Storage Tiering – 15 min
- Using DB Classify for Intelligent Database Tiering – 15 min
- DB Classify Demo – 30 min
- EMC VMAX Plug-in for OEM 12c – 15 min
- Q&A – 10 min

ORACLE EMC²

*More Oracle Deployed on EMC Storage Than
Any Other Vendor in 2012—IDC*

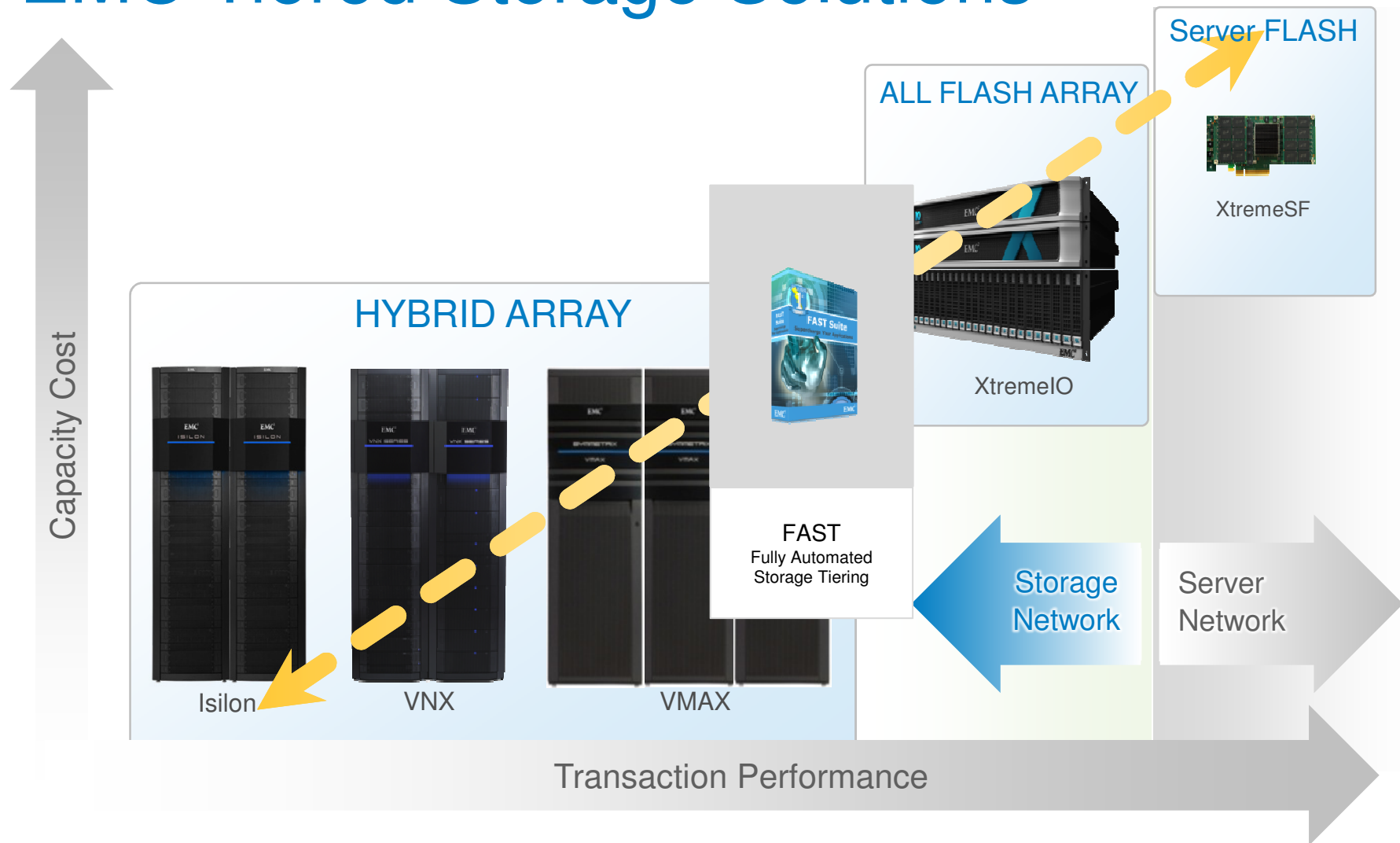
Source: IDC, Storage Users Demand Study 2012—Spring Edition: End Users Test Different Ways of Using Solid State Storage, doc #238127, December 2012



What is Tiered Storage

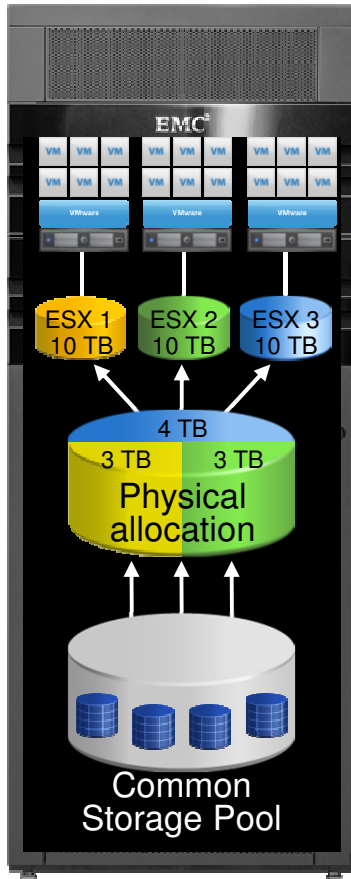
Tiered storage is the assignment of different categories of data to different types of storage media in order to reduce total storage cost.

EMC Tiered Storage Solutions



HOW Does EMC Tier Storage?

Start with Virtual Provisioning...

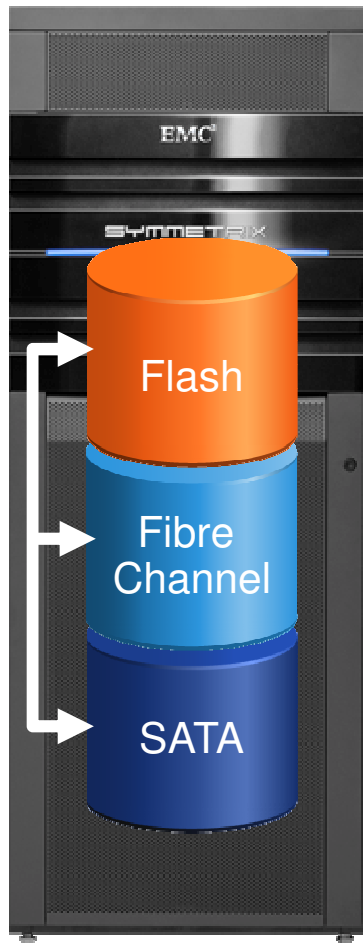


- Pool-based storage designed to improve the functionality available to a Storage LUN.
 - **Improves** storage utilization (thin provisioning, oversubscription, LUN abstraction).
 - **Reduces** storage provisioning complexity and overhead (Auto-provisioning groups, Less “clicks”).
 - **Automates** processes to easily grow, move, reclaim, and rebalance storage.
 - Non-disruptive upgrades that automatically rebalance pools to maintain performance.
 - Drain volumes to shrink pools
 - Virtual LUN migrator to move LUNs between pools
 - Reclaim white space

Benefits of Virtual Provisioning

- Significant environmental savings through disk drive reduction due to Wide Striping.
- Faster and simpler storage allocations. Less “clicks” to productivity.
- Improved Performance with Wide Striping and Automated Pool Rebalance.
- Zero-space storage recovered and reclaimed through *space reclaim* feature.

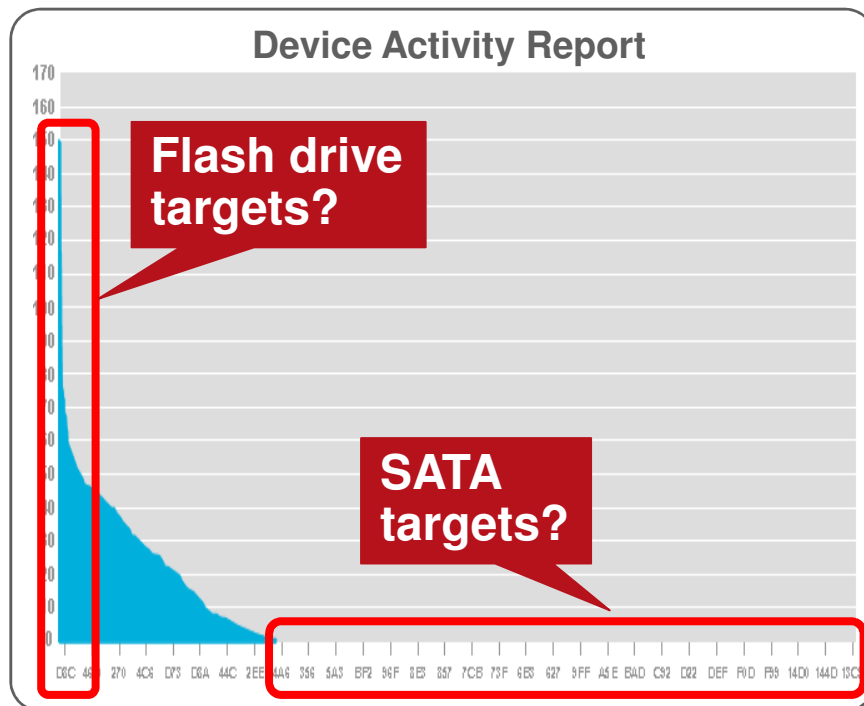
Add in Fully Automated Storage Tiering (FAST)



- Automation that dynamically monitors and relocates data based on application needs
 - Monitors sub-LUN I/O activity (768K)
 - Identifies sub-LUN data for relocation
 - Relocates for optimal performance
- Automates sub-LUN data migration
 - Promotes “hot” sub-LUN data to Flash drives
 - Demotes “cold” data to SATA drives

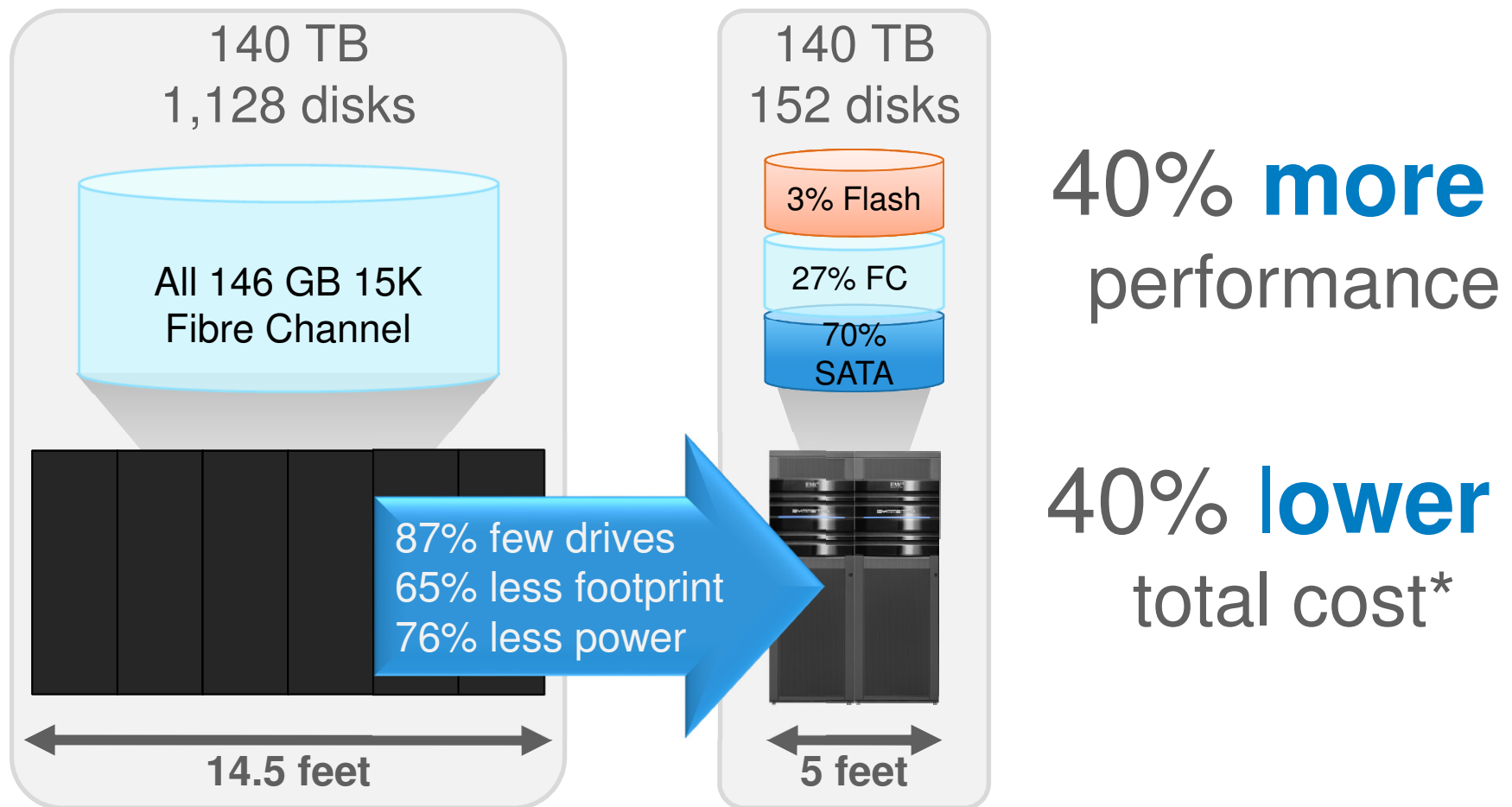
FAST automatically moves data to the right Storage Tier for improved performance, and cost savings due to operational efficiencies and increased usage of SATA storage

Why FAST Works - Workload Skew



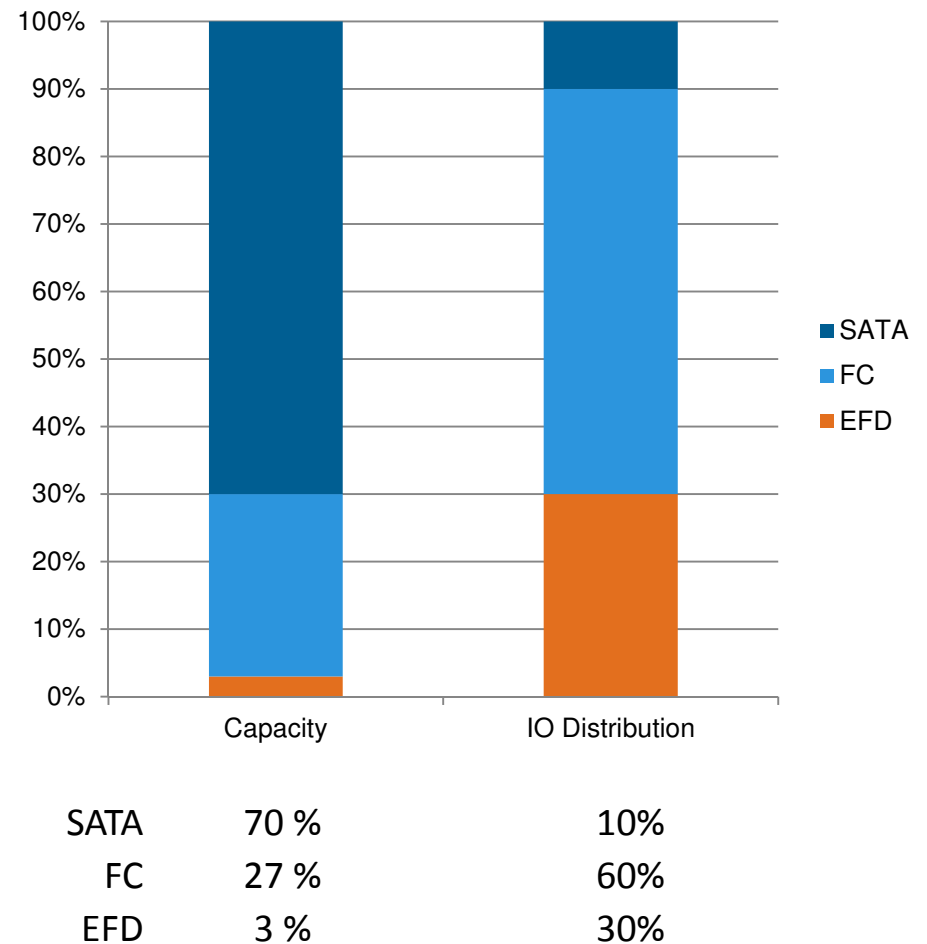
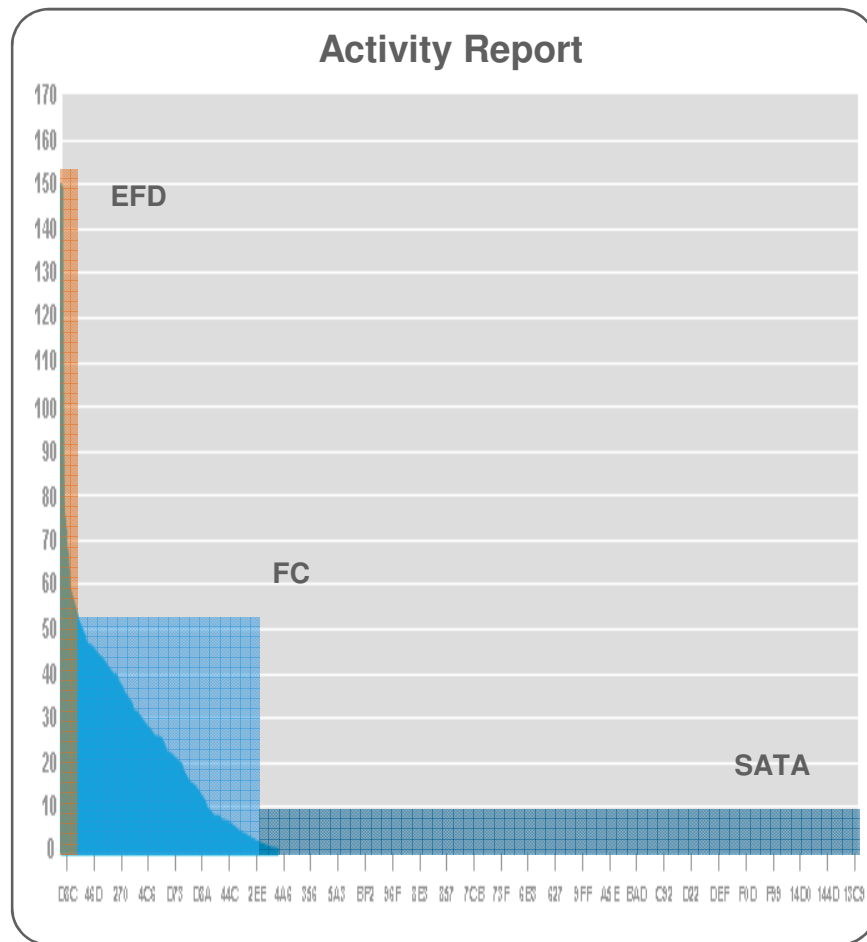
- Workload Skew is the reason FAST works!
- Skew defines an asymmetry in device usage over time
 - 85% of the workload serviced by 15% of the devices
- FAST accounts for device level sub-LUN skew
 - Relocates busiest extents (chunks) to higher performing storage tiers
 - “Idle” data moved to more cost-effective tiers

Results of a Consolidation with FAST



* TCO based on acquisition costs with three years' maintenance

Workload Distribution with FAST



Benefits of Fully Automated Storage Tiering

- Significant environmental savings through Wide Striping and Automated Tiering across FLASH, FC, and SATA disk drives.
- Reduce ongoing performance management effort due to Automated Tiering.
- Improve application performance by introducing FLASH drives, and a tool to efficiently tier hot workloads to those drives.

EMC DB Classify

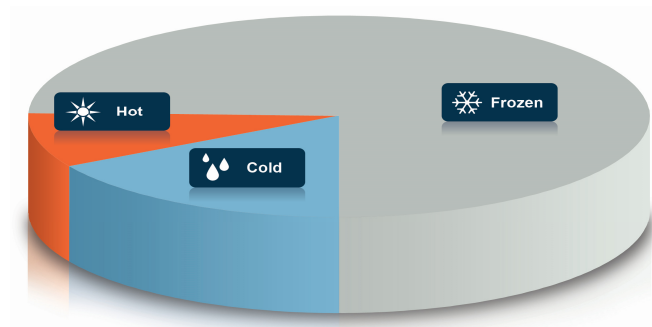
EMC DB Classify – Right-Tiering Analysis

What is it?

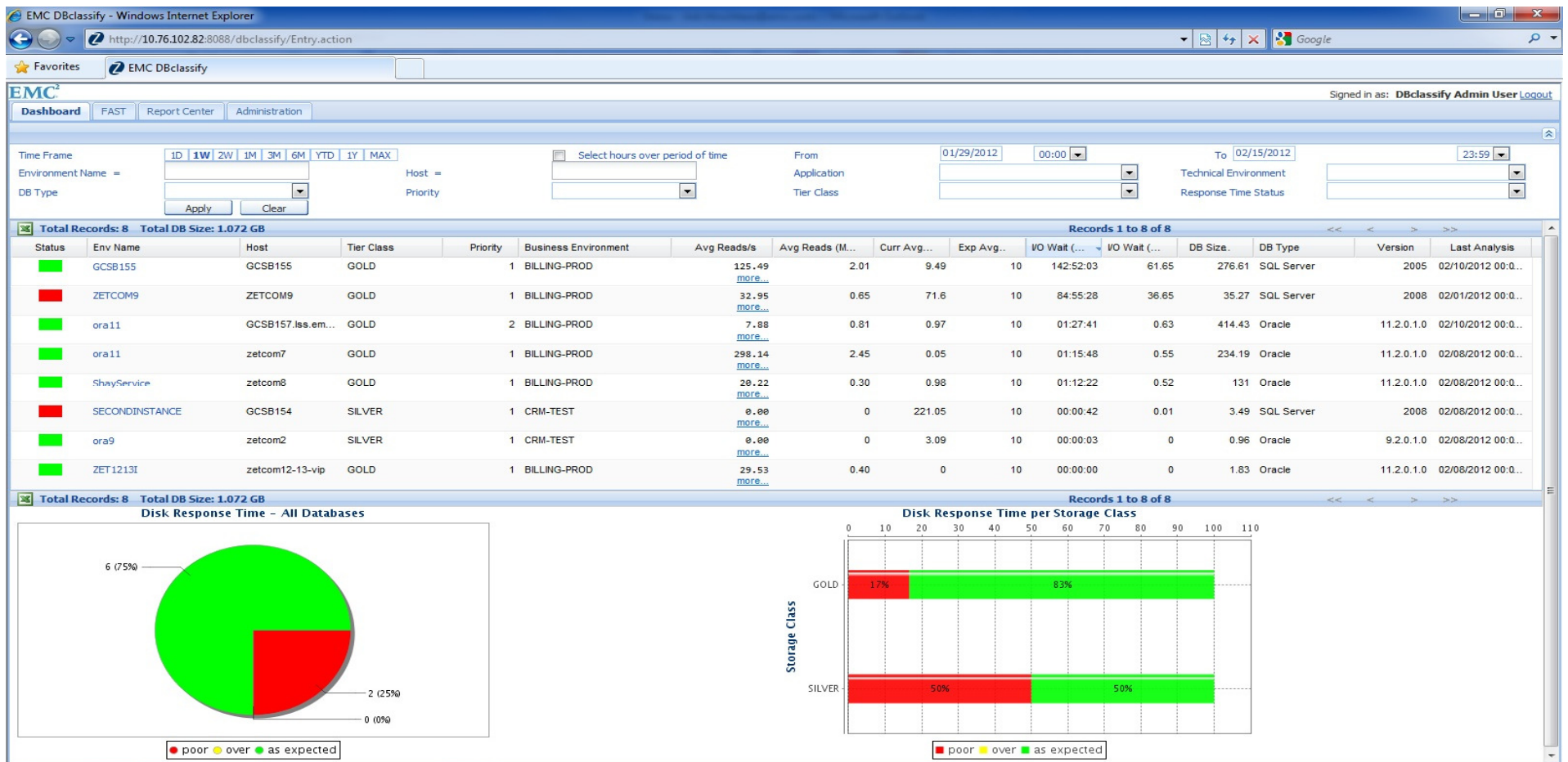
- **High level:** An EMC service that helps customers identify the most cost-effective way to optimize database storage infrastructure in a tiered storage environment.
- **DB Classify Delivers:**
 - Identify who access data and how frequently
 - Identify most, and least, frequently used tables and columns
 - Identify ranges of data values that are most, and least, frequently used
 - Determine whether data access is different from what was expected
- **DB Classify Benefits:**
 - Reducing I/O wait times for most critical applications
 - Reduce TCO by recommending the placement of the right database objects on the right storage tier, based on specific usage patterns
 - Provide the business ROI for the automation of I/O balancing and optimization leveraging intelligent storage tiering

Why DB Classify - Storage Tiering Challenges

- DB Classify helps to make optimal use of tiered storage
- What storage type and capacity is needed?
 - Server Cache, EFD, FC, SATA
- How to set up Tiering policies based on business value?
 - How to ensure critical applications get required performance
 - Which data can be a candidate for lower storage tiers (SATA or Archive?)
 - Multiple database environments in a single Storage Array (test, dev, prod)

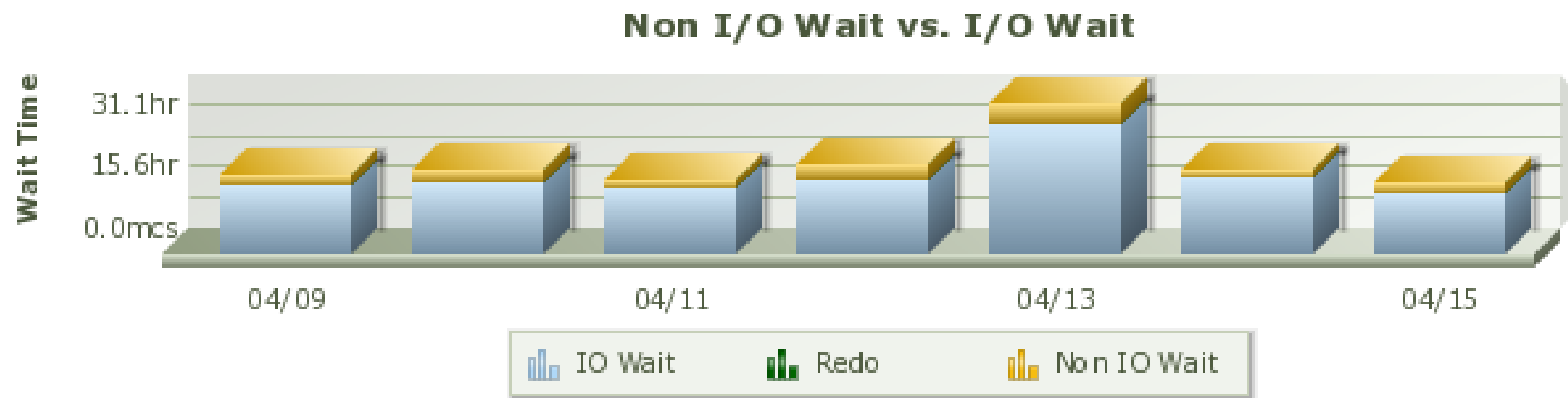


Enterprise Dashboard

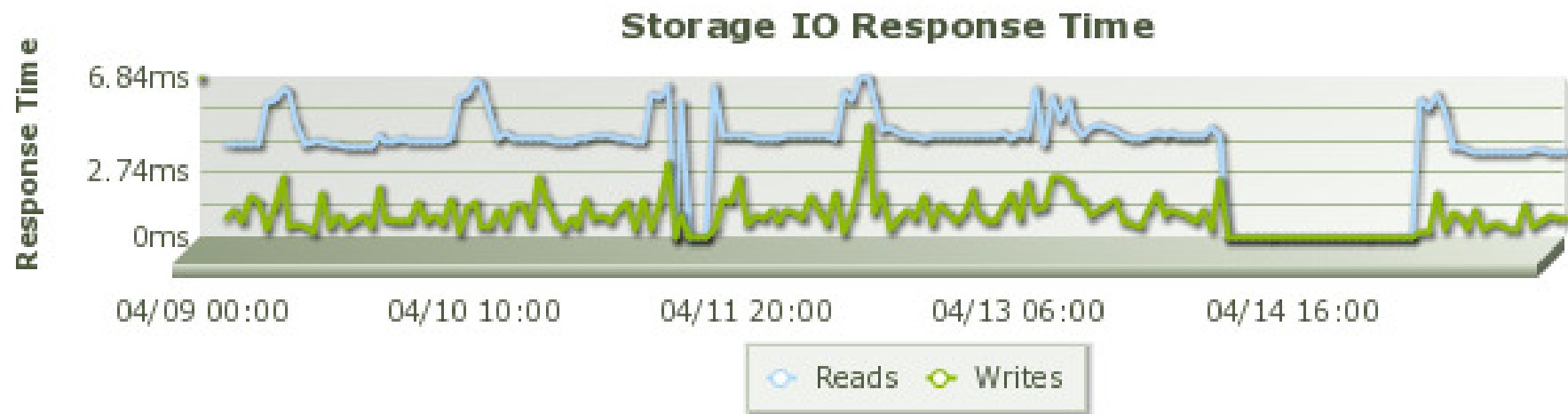
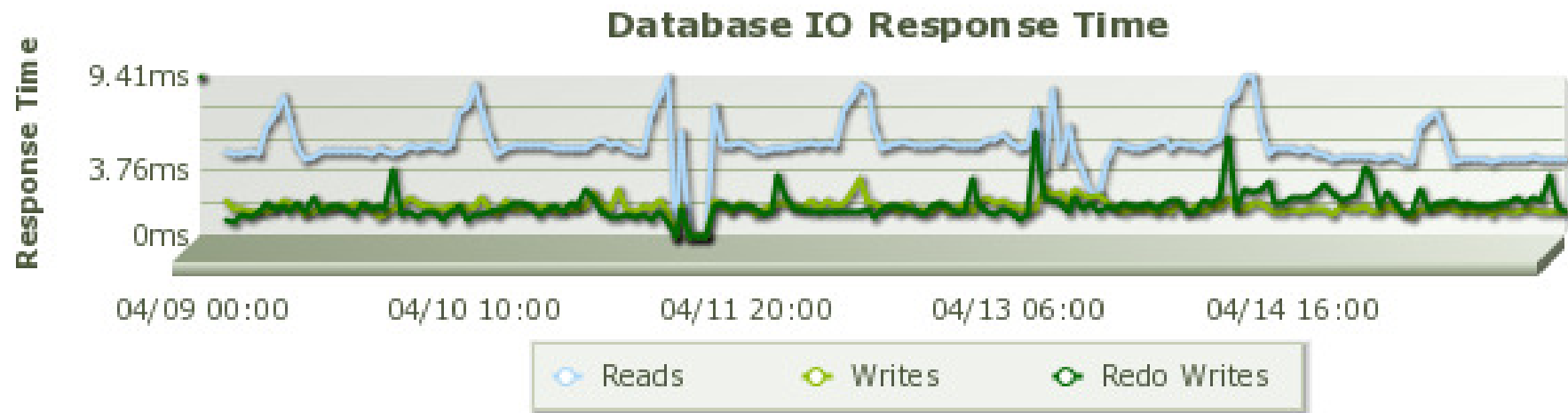


*Inventory all Oracle and SQL Server Databases
Stack Rank by I/O and Build Use Case to Virtualize*

Total Wait Time vs IO Wait Time

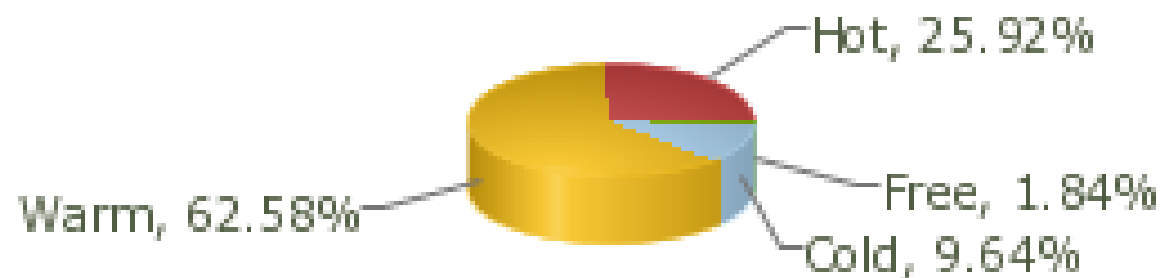


Database IO Time vs Storage IO Time



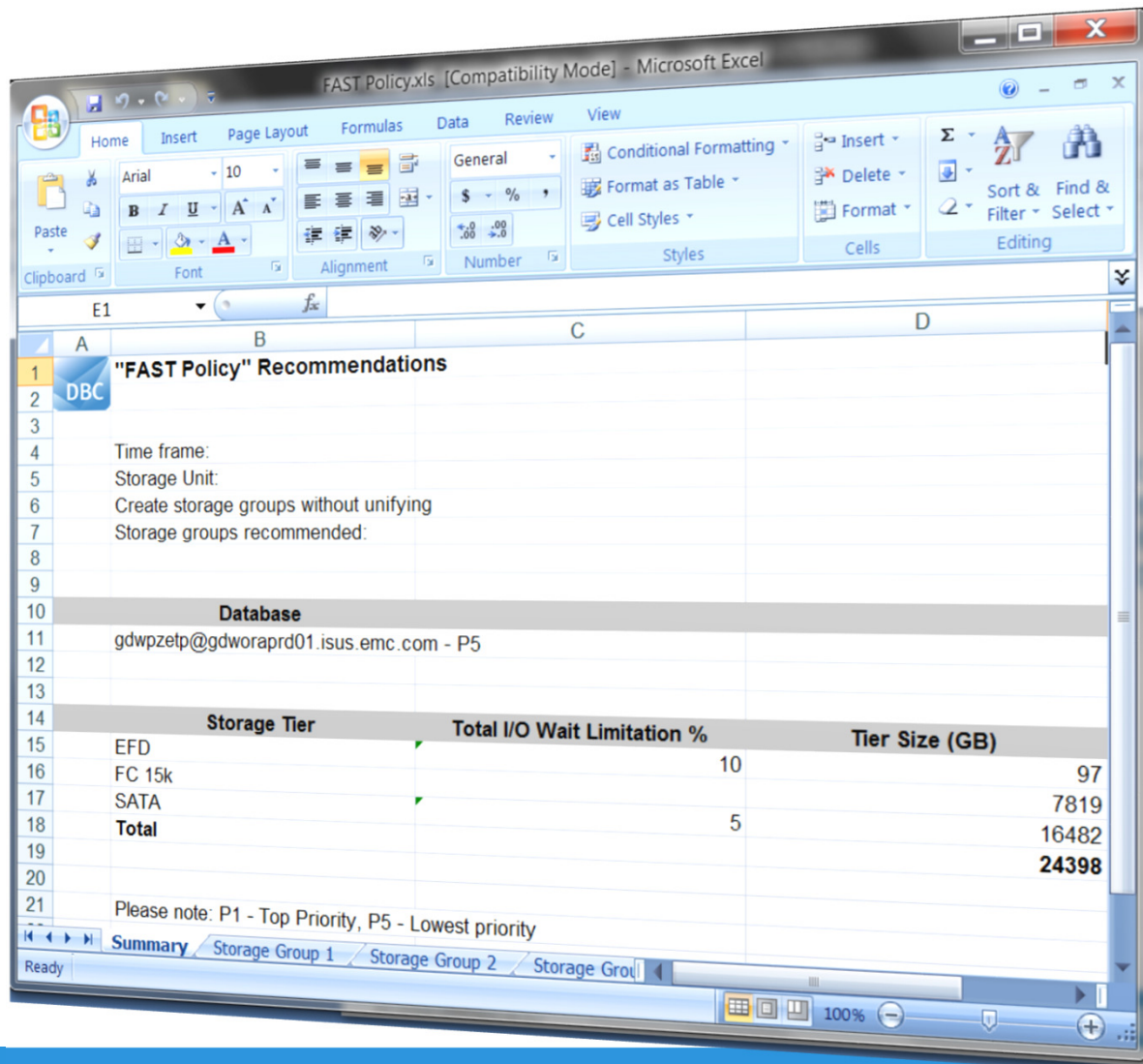
Current Database Usage

Database Usage: Total Size = 646.96 GB



Undo Temp Free Cold Warm Hot

Summary Results – Tier Recommendation



The screenshot shows an Excel spreadsheet titled "FAST Policy.xls [Compatibility Mode] - Microsoft Excel". The spreadsheet displays the output of a FAST Policy analysis. The "FAST Policy" Recommendations section includes a database entry and a table of storage tier recommendations. The table has three columns: "Storage Tier", "Total I/O Wait Limitation %", and "Tier Size (GB)". The rows show recommendations for EFD, FC 15k, and SATA, with a total recommendation of 24398 GB. A note at the bottom states: "Please note: P1 - Top Priority, P5 - Lowest priority". The spreadsheet also shows a "Summary" tab and a "Storage Group 1" tab.

Storage Tier	Total I/O Wait Limitation %	Tier Size (GB)
EFD	10	97
FC 15k		7819
SATA	5	16482
Total		24398

Output is a list of storage groups, with candidate devices and storage amounts per tier



EMC DB Classify DEMO

John Kelly – EMC Delivery Manager, GPS Americas

*DB Classify - vLab Available! Ask you EMC or
Partner System Engineer!*

Oracle Enterprise Manager VMAX Storage Plug-in

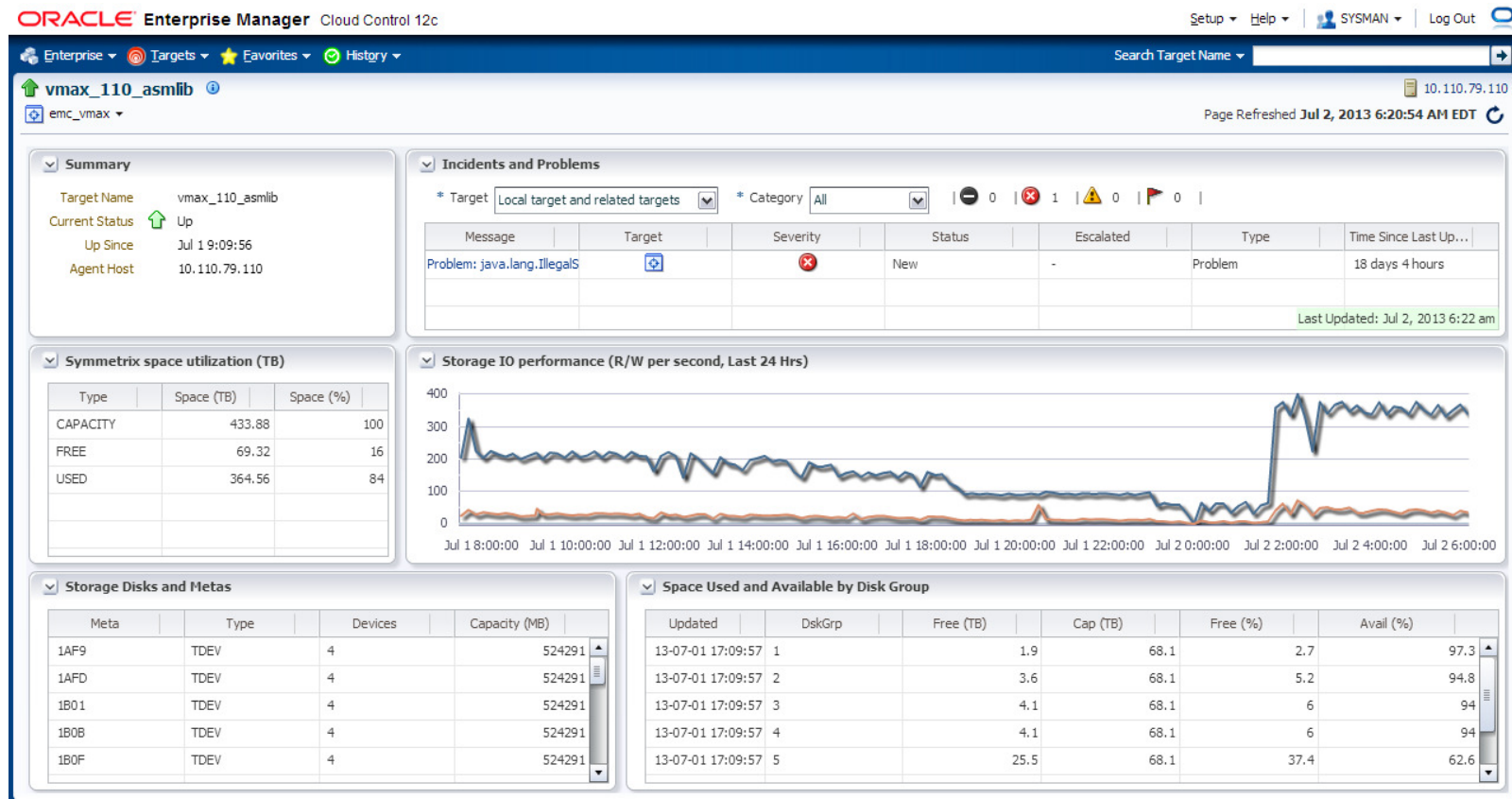
Oracle Enterprise Manager VMAX Plug-in

What is it?

- **High level:** Free plug-in that provides comprehensive Availability, Performance, and Configuration information for EMC VMAX Storage Arrays.
- VMAX Plug-in Delivers:
 - Pinpoint storage related performance problems
 - Navigate from data file → host volume → storage device
 - Optimize storage allocation by tracking storage usage by database
- VMAX Plug-ins Benefits:
 - Consolidate all information about Oracle and EMC VMAX storage in OEM 12c Management Console
 - Correlate availability and performance problems across entire set of IT components
 - Enhance service modeling and perform comprehensive root cause analysis
- *Plug-in for VNX will be available in the next 2-3 months*

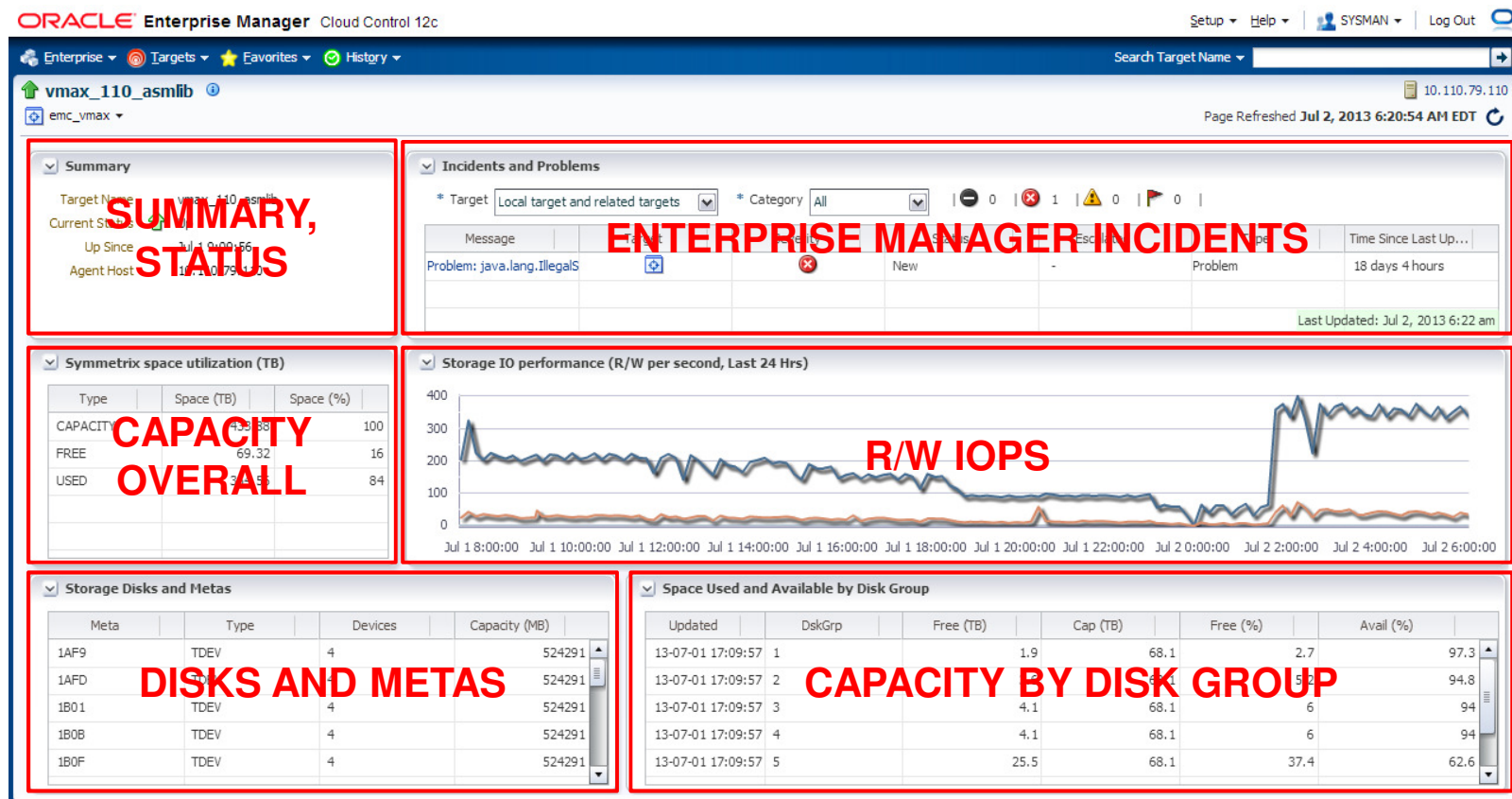
OEM for VMAX Plug-in Dashboard

- The different information areas of the home page:



OEM for VMAX Plug-in Dashboard

- The different information areas of the home page:



OEM VMAX Plug-in DEMO

Oracle Extensibility Site - <http://apex.oracle.com/pls/apex/f?p=34841:11>

Everything Oracle Community at EMC -
https://community.emc.com/community/connect/everything_oracle

Thank You!