



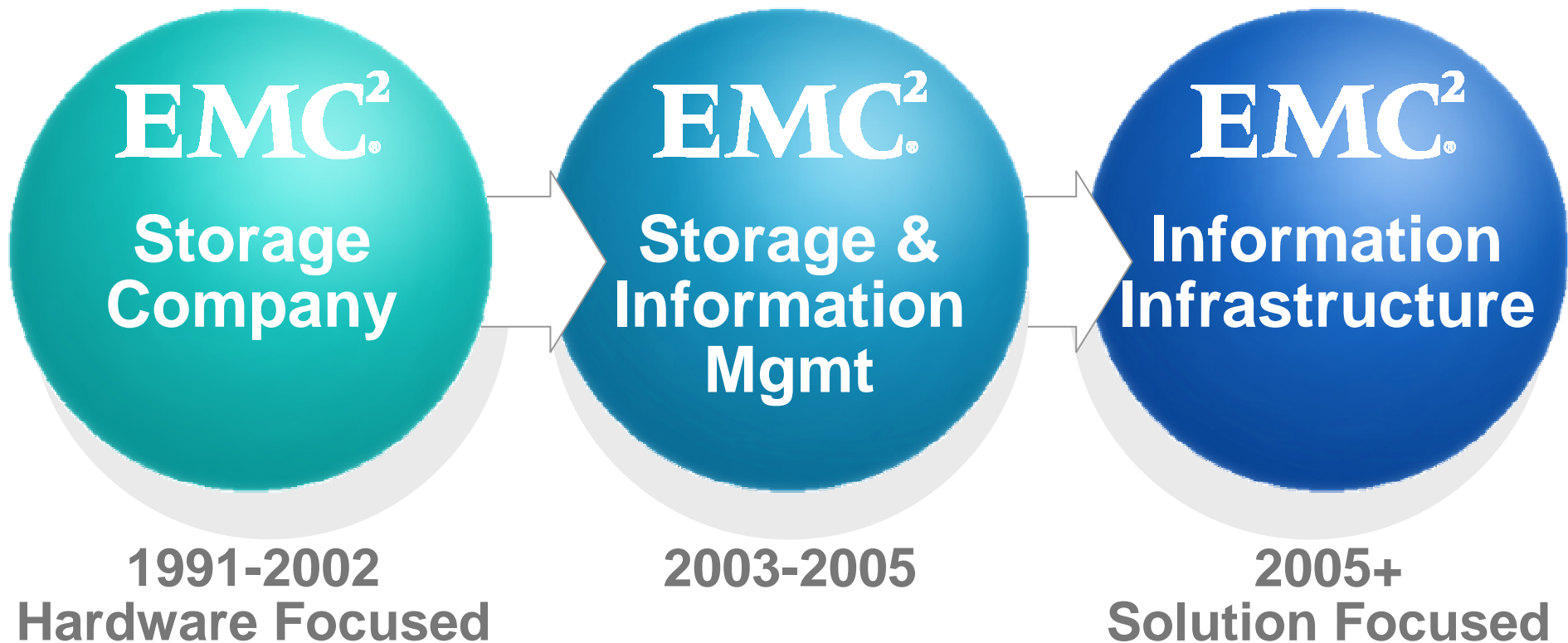
# EMC Resource Management Software Overview

**Glenn O'Donnell**

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Resource Management Software Group**



## EMC has Evolved as the Market has Evolved

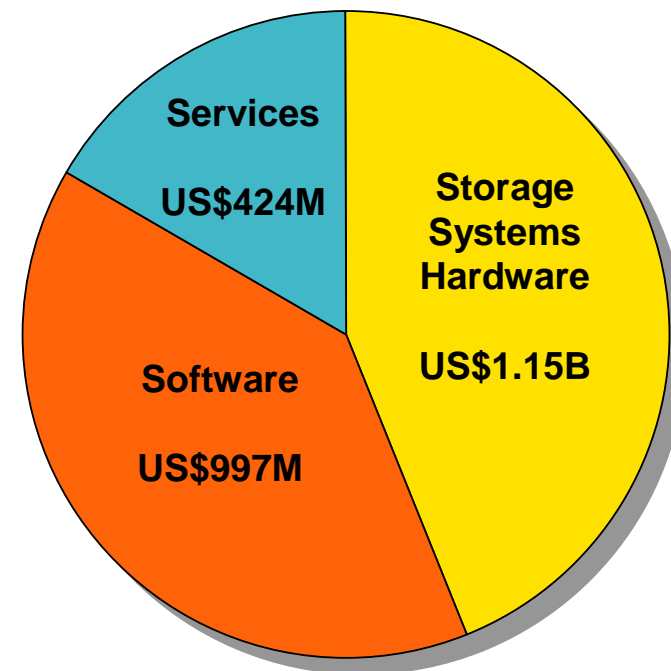




## EMC Offers MUCH More than Storage Hardware

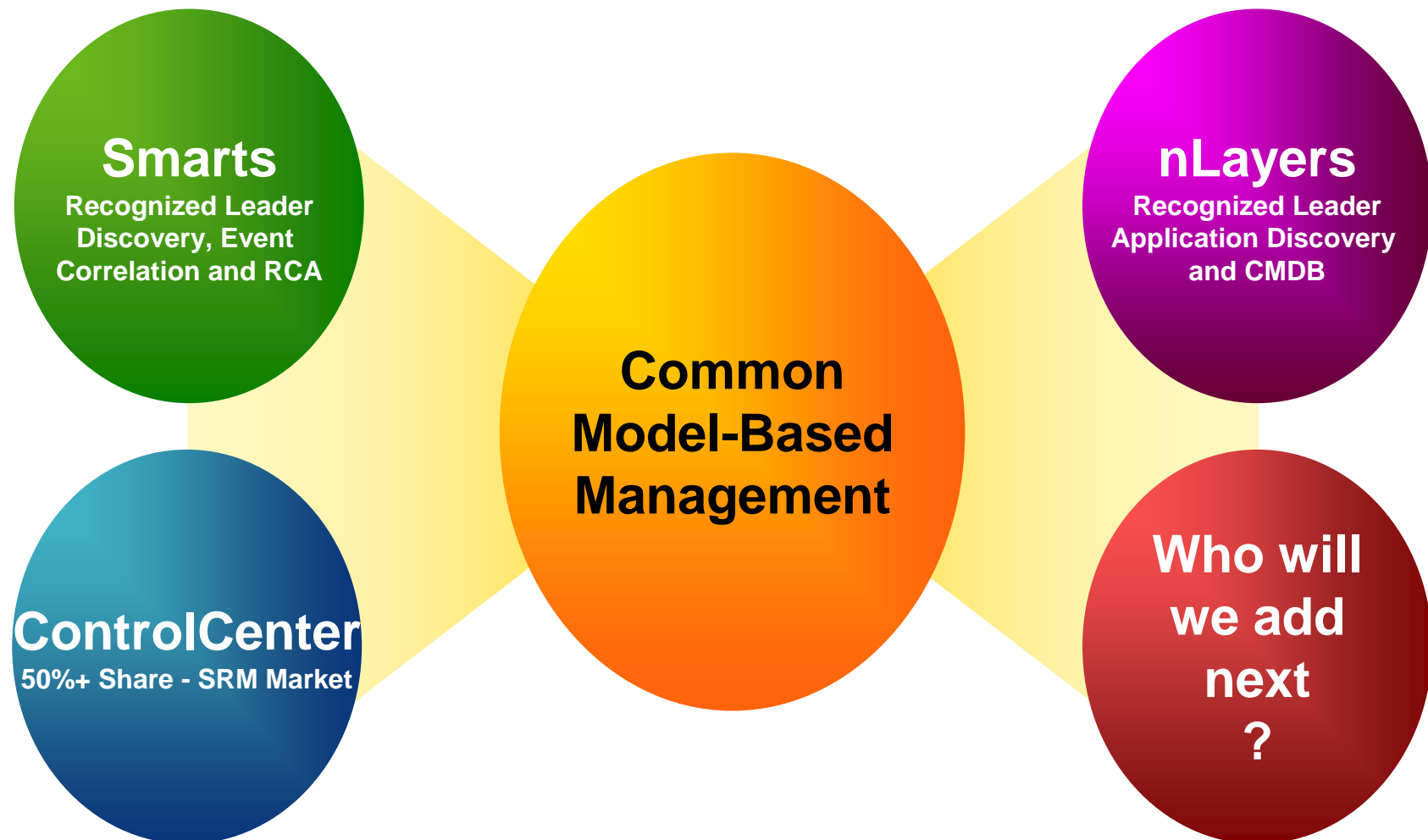
- 39% of EMC's US\$10B in revenue comes from software
  - Content, virtualization, resource mgmt
- 17% comes from services
  - EMC Consulting is growing quickly
- EMC is the seventh largest software company (by revenue)
- Most recent acquisitions have been software companies
- Resource Management Software Group formed in 2005
  - Offers operational automation
  - Expands upon storage software

### EMC 2Q06 Revenue





## Resource Management: Building On Our Strengths



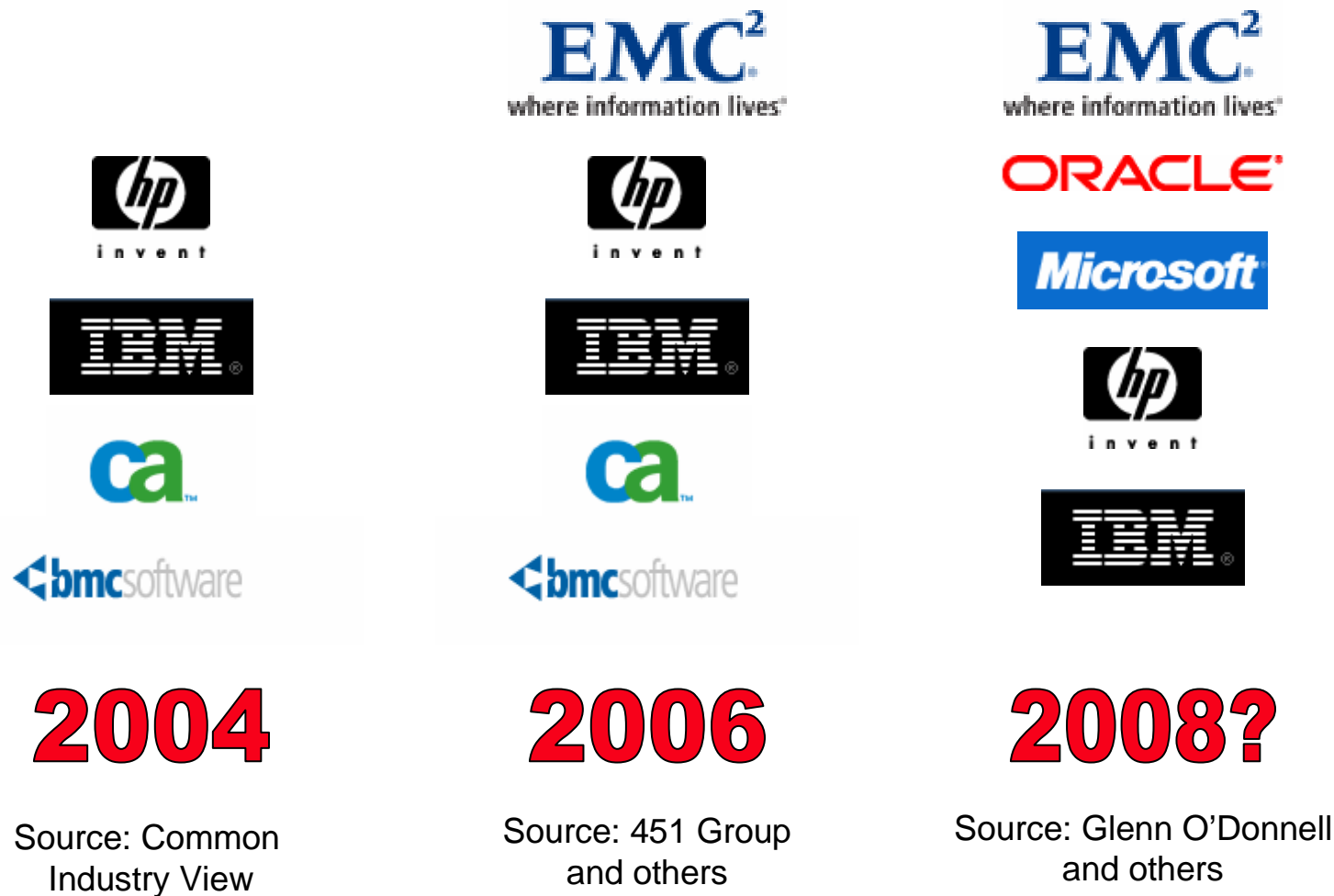


## EMC Resource Management Software Group (RMSG)

- EMC was already a leader in storage management
  - ControlCenter, VisualSRM, SAN Advisor, etc.
- EMC acquired Smarts in early 2005
  - Leader in network monitoring and analysis
  - Smarts revenue is now doubling every year
- Latest acquisition (nLayers) adds application discovery and CMDB capabilities
  - Extraordinary customer demand and revenue growth
- Superior technology and integration characterize the RMSG strategy
  - All with a goal of automating IT operations
- Acquisitions will continue



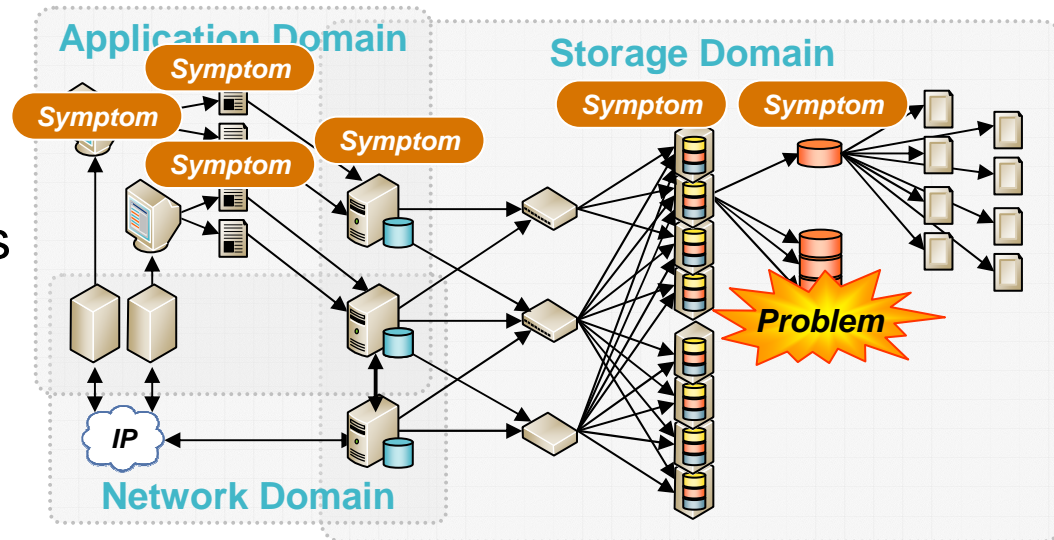
## Management Vendor Consolidation





## What Is the Customer Challenge?

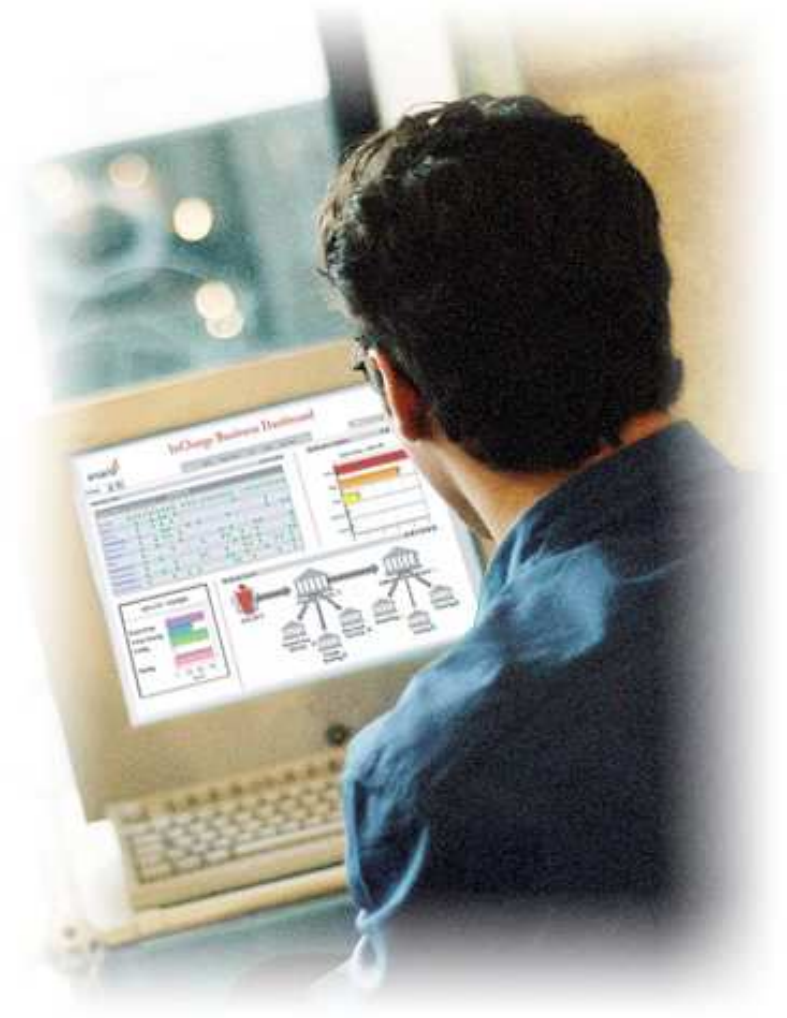
- Too much data, not enough information
  - Too many trouble tickets being opened in the call center—can't keep up
- Difficult to determine root cause
  - Can't distinguish among **network**, **storage**, and **application** faults
- Difficult to gauge the impact of an IT-level problem to the business
- Chaotic incident and problem management execution  
***Management solutions send alarms for everything***





## EMC Smarts Value Proposition

- Automated, actionable intelligence
  - Pinpoint service-affecting problems in real time
  - Quantify impact to prioritize action
  - Update automatically to adapt to infrastructure changes
- Cross-domain correlation
  - Correlate information, applications, infrastructure, and business services across management silos
- Business-centric
  - Gain insight into how IT problems impact services and customers





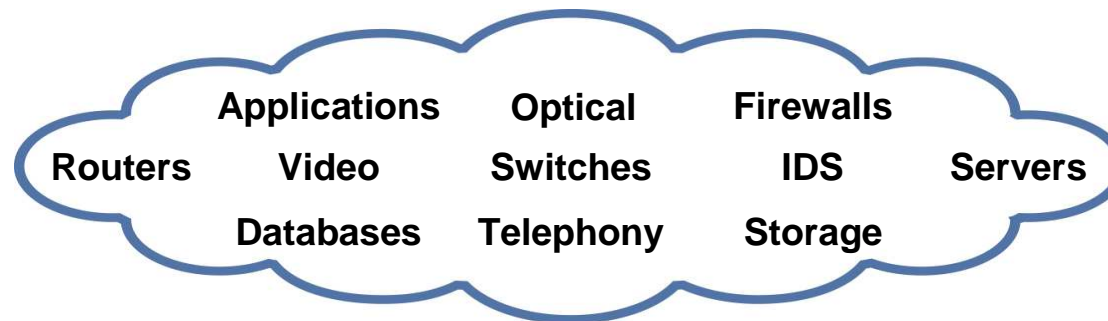


## What is Missing in Competitive Products?

### Display

**No built-in analysis**  
**Ongoing rules writing  
and maintenance required**

### Data and Event Collection





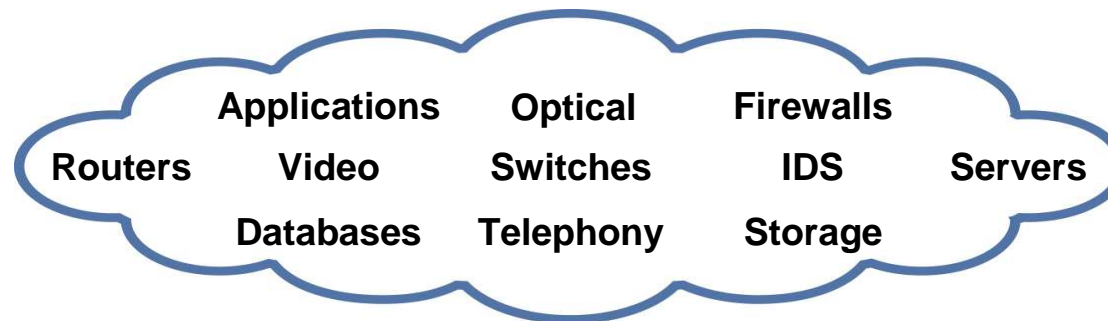
## Managing Services in Real Time with EMC Smarts

**Automated Actionable Intelligence**

**Analytics**  
**Codebook Correlation Technology™**

**Abstraction**  
**EMC Smarts Common Information Model™**

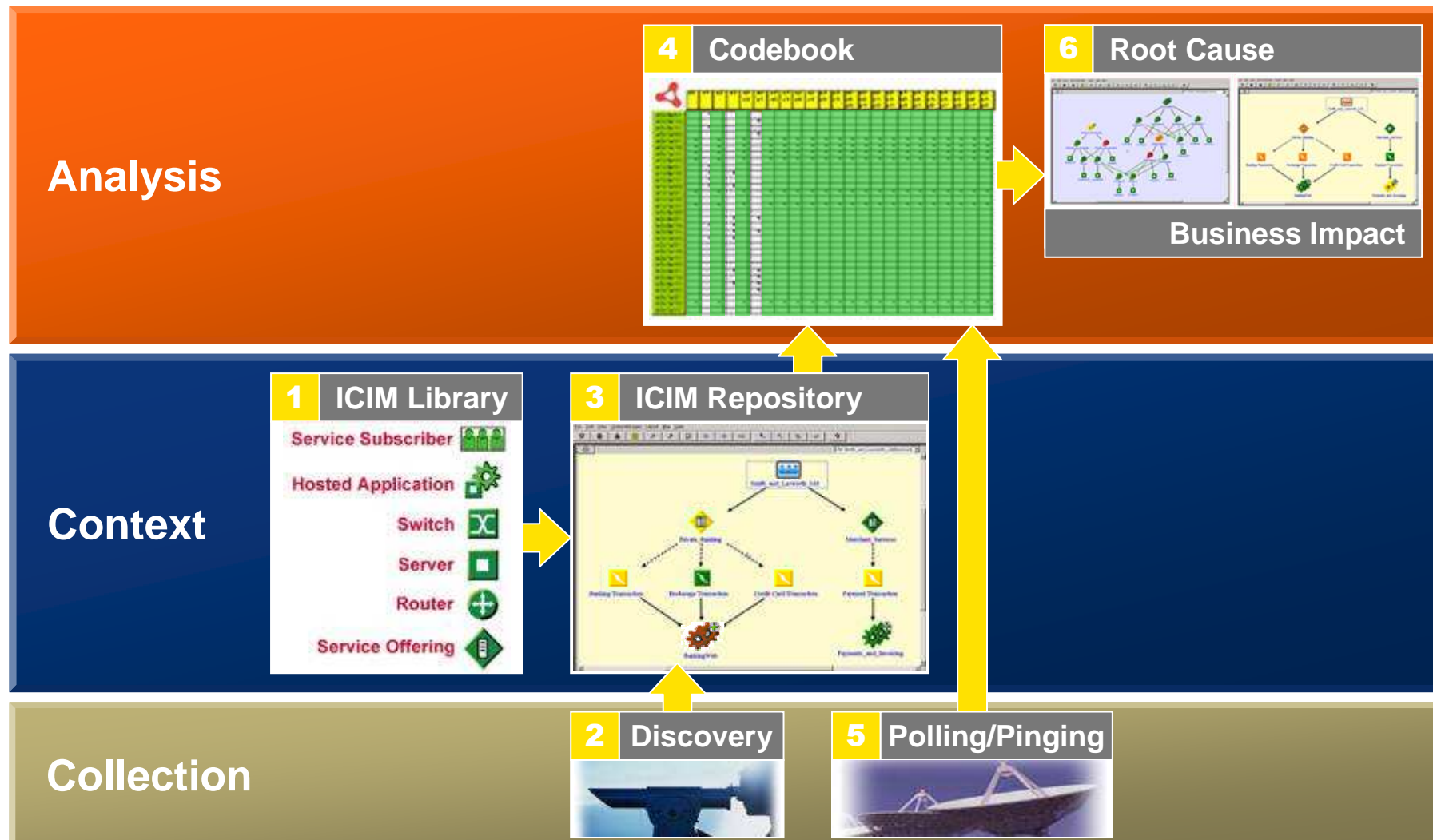
**Data and Event Collection**



***With patented, industry-leading technologies***



# Automating Service Management—Start to Finish

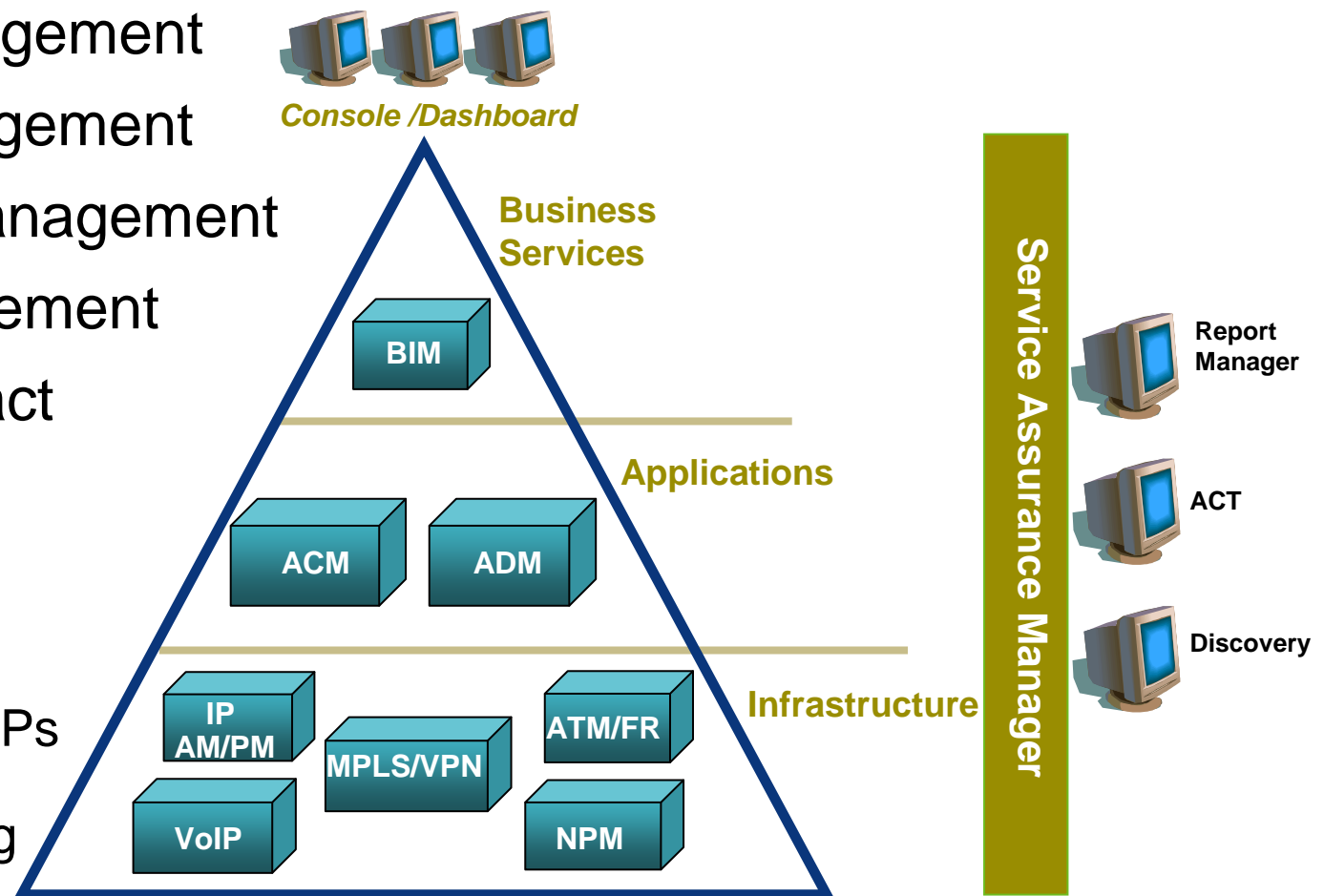




## The Objective: Increase *Business Value* Through IT

- Network Management
- Storage Management
- Application Management
- Server Management
- Business Impact Management
- Value-added Capabilities

- Failover
- Overlapping IPs
- Adapters to link to existing systems and tools





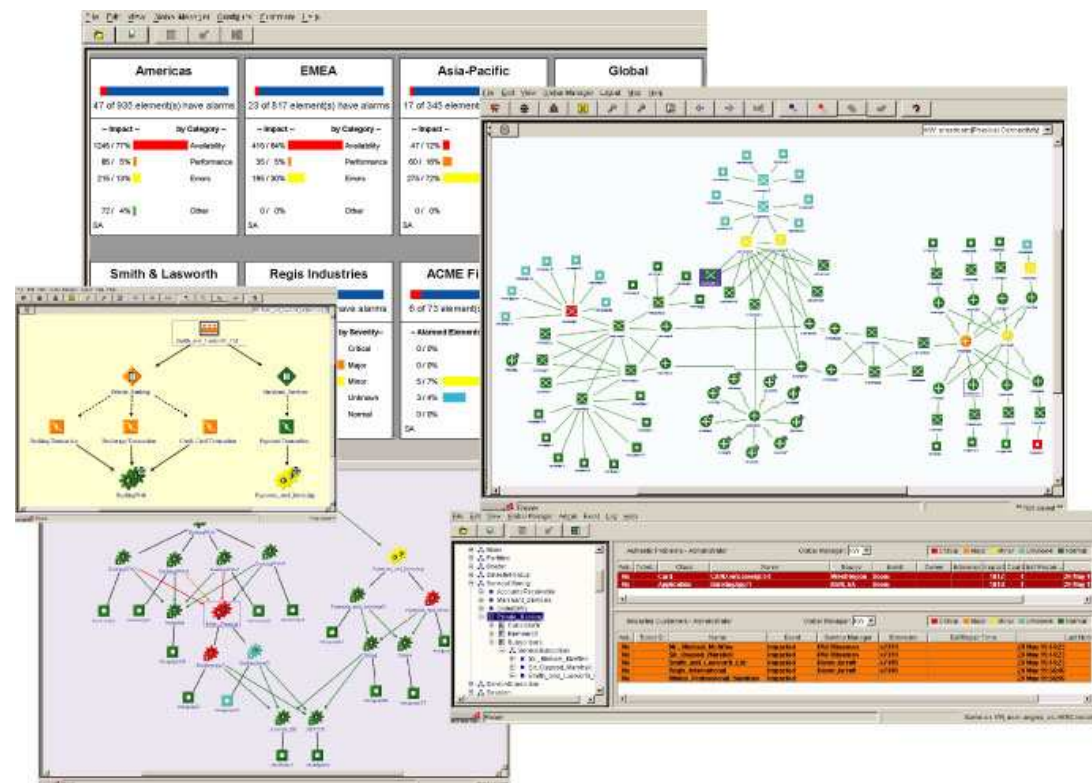
# Service Assurance Manager

- Features/Functions

- Integrates and correlates – topology, polled data, events, and *authentic problems*<sup>TM</sup> – across networks, systems, applications, & business
- “A MOM with SMARTS” - rich context for analysis
- Integration for all Smarts solutions
- Integrates with other management tools: agents, dashboards, asset/inventory
- Integrates with OSS systems (e.g., CRM, Provisioning)

- Benefits

- Allows integration of silo tools into a unified, end-to-end solution
- Real-time, end-to-end management through a “single pane of glass”

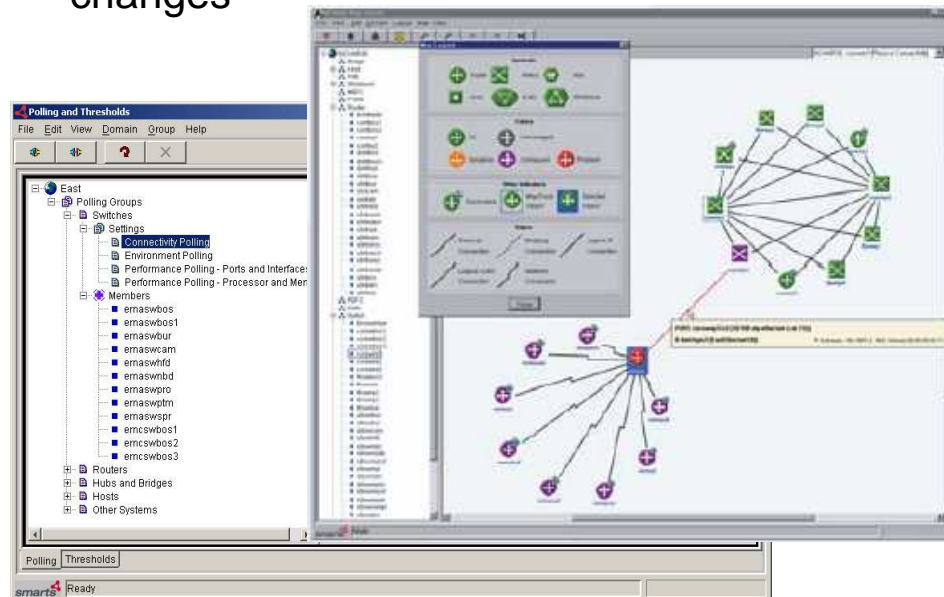




# IP Availability Manager

- Features/Functions

- Auto-discovers IP network details: layers 1,2,3: entities and relationships
- Automates real-time root cause analysis of all critical network connectivity problems at all layers
- Calculates the impact of problems
- Adapts automatically as the network changes



- Benefits

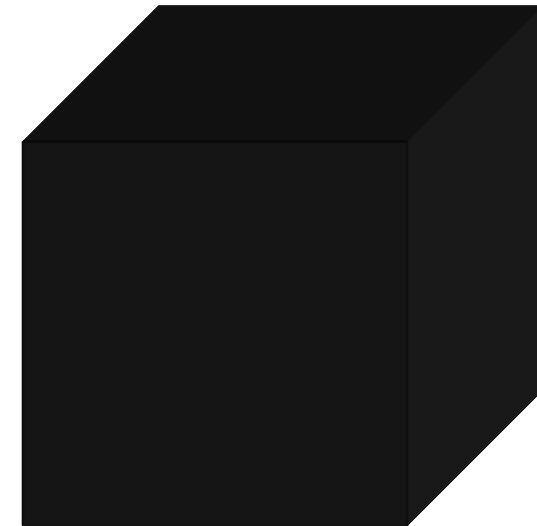
- Dramatically improves availability of IP-based networks
- Cuts operations costs:
  - Cheaper to implement, operate
- Built-in analytics for fast implementation and no maintenance
- Automates every step to:
  - Eliminate manual analysis, rules-writing
  - Reduce reliance on skilled resources
  - Streamline processes
  - Speed MTTR to improve customer satisfaction and protect revenue



## EMC Application Discovery Manager (ADM)



- Technology from nLayers acquisition
- Illuminates the “darkness” within applications
- Discovers and maps application relationships
- A powerful CMDB solution
  - Configuration Management Database
  - Identify changes immediately
- Rapid time to value via appliance
  - Quick installation
  - Minimal configuration
- A significant step toward automated service management







## IP Availability Manager extension for NAS

- Automate real-time root cause and impact analysis
  - Critical IP network connectivity problems, including NAS connectivity
- Identify business impact of network problems with EMC Smarts Business Impact Manager

The screenshot shows the EMC Smarts Business Impact Manager interface. It features a main table with columns for Severity, Acknowledgment, Owner, Class, Name, Event, First Notify, and Last Notify. The table is divided into sections: Business Entities Default, Business Services Default, Root Cause, and Symptoms. Annotations with arrows point to specific features:

- Identify Affected Business Departments:** Points to the 'Business Entities Default' section, which lists departments like HR, Engineering, and Finance.
- Identify Affected Services:** Points to the 'Business Services Default' section, which lists services like Engineering.
- Isolate Root Cause Problems:** Points to the 'Caused By' tab in the 'Notification Properties' dialog, which shows a table of events including 'FileServer' and '172.24.95.38 [Celerra Data Mover - server\_4]'.

The 'Notification Properties' dialog is open, showing details for a notification titled 'Department Impacted [100% 15 Sep 16:29:26]'. The 'Caused By' tab is selected, showing a table of events.

Class	Name	Event
FileServer	172.24.95.38 [Celerra Data Mover - server_4]	Down





## Storage Insight for Availability (SIA)

- Automated root-cause analysis of availability problems across SAN infrastructure
  - Correlate events/alerts to pinpoint service-affecting hardware problems
  - Dramatic reduction in downtime and mean-time-to-repair
- Automated impact analysis
  - Prioritize what needs to be fixed immediately based on impact
- Cross-domain correlation across SAN and IP infrastructure
  - Manage end-to end-across multiple domains, silos, and tools





## Automating Root-Cause and Impact Analysis with SIA

- Automatically diagnose root-cause problem
  - Symmetrix disk, director, unit, service processor failures
  - CLARiiON unit, service processor, disk failures
- Identify impacted elements
  - Host Devices and File Systems
  - Celerra Data Movers
  - PowerPath Paths

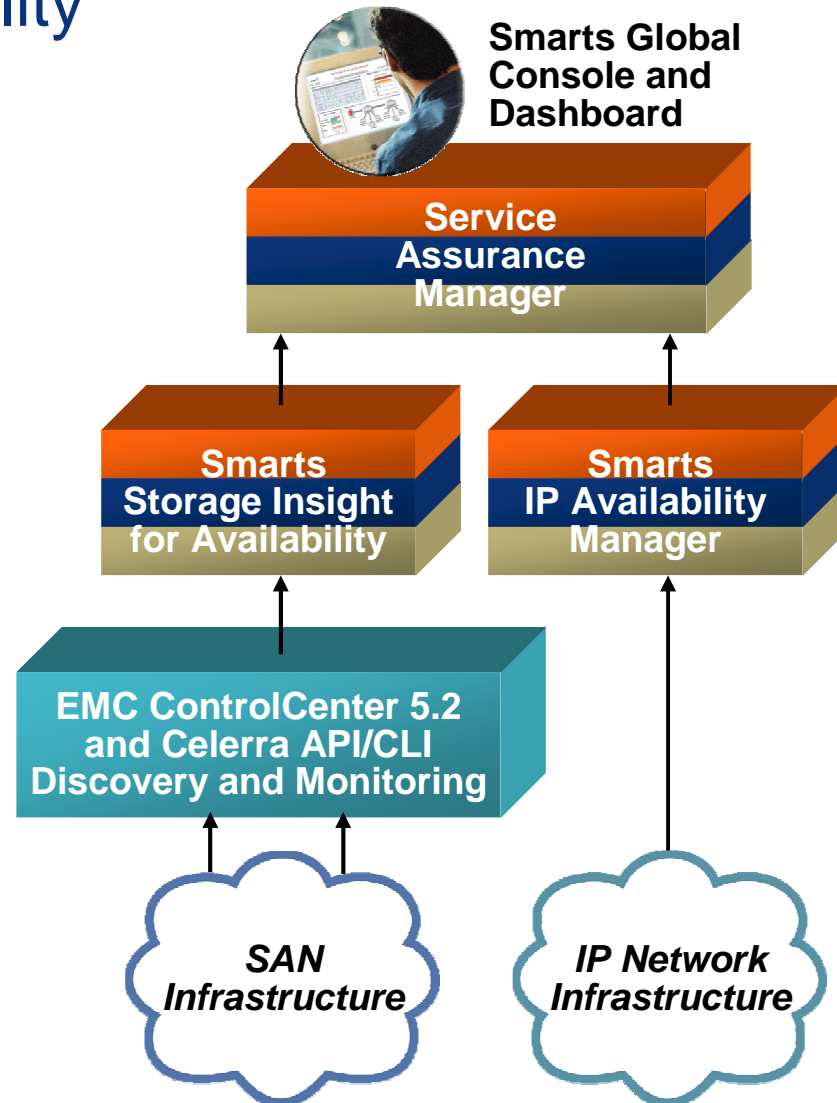
The screenshot displays the EMC SIA interface. At the top, the 'InCharge Manager' is set to 'INCHARGE-NA2'. A table lists components, with 'ClariionStorageProcessor' and 'EMC-CX700-APM' highlighted. A blue arrow labeled 'Isolate Root-Cause Problems' points to this row. Below, a notification states 'ClariionStorageProcessor Down [100% 13 Oct 13:22:06]'. The 'Impact' tab is active, showing a list of impacted elements. A blue arrow labeled 'PowerPath Paths' points to a row of 'SCSITargetInitiatorDataPath' entries. Another blue arrow labeled 'Host Devices' points to a row of 'SCSITargetInitiatorDataPath' entries. A yellow arrow labeled 'Switch Port' points to a 'FibreChannelPort' entry. The interface also shows a 'Codebook: SI-INDIA' and a 'ms' label.

Class	Name
SCSITargetInitiatorDataPath	losbd192 emcpowerc Path - losbd192 to LUN 19 on E...
SCSITargetInitiatorDataPath	losbd206 \\.PhysicalDrive5 Path - losbd206 to LUN 101 on EMC-CX700-AP...
SCSITargetInitiatorDataPath	losbd206 \\.PhysicalDrive4 Path - losbd206 to LUN 102 on EMC-CX700-AP...
SCSITargetInitiatorDataPath	losbd205 \\.PhysicalDrive9 Path - losbd205 to LUN 100 on EMC-CX700-AP...
SCSITargetInitiatorDataPath	losbd206 \\.PhysicalDrive8 Path - losbd206 to LUN 9 on EMC-CX700-APM...
SCSITargetInitiatorDataPath	losbd206 \\.PhysicalDrive1 Path - losbd206 to LUN 10...
SCSITargetInitiatorDataPath	losbd205 \\.PhysicalDrive10 Path - losbd205 to LUN 9 on EMC-CX700-APM...
SCSITargetInitiatorDataPath	losbd192 emcpowerb Path - losbd192 to LUN 20 on EMC-CX700-APM0005...
SCSITargetInitiatorDataPath	losbd206 \\.PhysicalDrive6 Path - losbd206 to LUN 100 on EMC-CX700-AP...
SCSITargetInitiatorDataPath	losbd205 \\.PhysicalDrive10 Path - losbd205 to LUN 101 on EMC-CX700-APM...
FibreChannelPort	ASELAB_DS32B_40 Port 3
ClariionStorageProcessor	EMC-CX700-APM00051500756 Enclosure [SPE] SP A



## Storage Insight for Availability

- Discovery and monitoring sources
  - Storage: EMC ControlCenter 5.2 and Celerra API/CLI
  - IP Network: SNMP traps
- Storage Insight for Availability
  - Automated root-cause and impact analysis in SAN infrastructure
- Service Assurance Manager
  - Single point of integration for all Smarts analysis solutions
- Global console and dashboard
  - Actionable intelligence, not just a pretty picture
- IP Availability Manager
  - Automated root-cause and impact analysis in IP networks
  - Correlation between storage and network domain, through Celerra Gateway





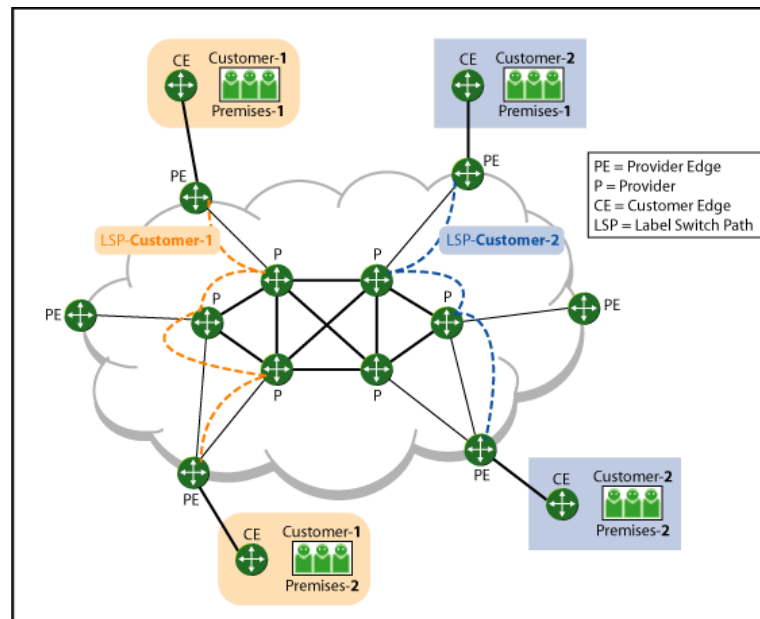
# MPLS Manager

- Features/Functions

- Solution automatically discovers MPLS networks in detail
  - LSP, LSP Hops, LSP Segments
  - VPNs, VRFs, Route Targets
- Provides visibility into the MPLS infrastructure and the underlying IP network
- Automatically correlates MPLS- related problems with IP connectivity problems: root cause & impact
- Processes VPN/MPLS notifications, Syslogs, & traps

- Benefits

- Increases quality and reduces operations costs of MPLS implementations
- Scales to the largest, most complex environments to support unlimited growth
- Manages holistically, from the core to the customer





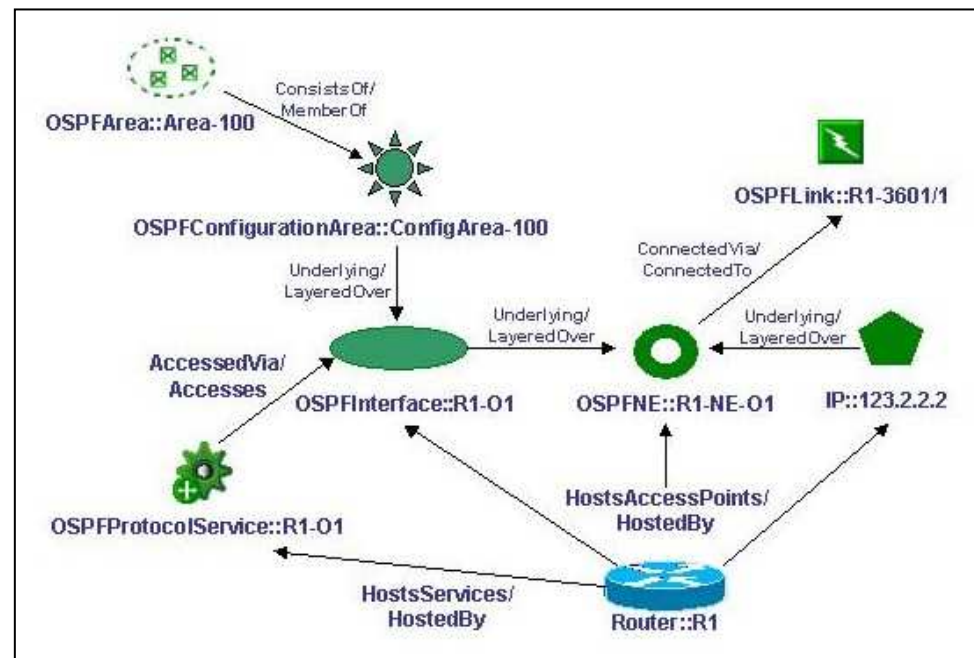
# Network Protocol Manager

- Features/Functions

- Root cause & impact analysis of protocol-related problems
  - BGP, OSPF, others to come
- Cross-domain correlation to identify impact of network connectivity problems on protocols
- Auto-discovery and modeling of protocol domain using:
  - SNMP MIBs
  - Configuration information

- Benefits

- Provides insight into complex problems that are hardest to diagnose
- Analyze protocol-related problems in context
  - Uniquely enabled by ICIM and Codebook Correlation Technology





## Deliver Business Value via EMC Resource Management

- Model-based technology is the most powerful in the market
  - Rules-based systems cannot adapt
  - The model reflects the real world
  - Analysis is guided by the model of the real world
  - Analysis instantly adapts to changes because the model adapts
- Eliminate operational waste by automating processes
- Plans for comprehensive automation require such capability
- EMC is on a path to continue building superior solutions
  - Acquisitions are not finished
  - EMC is already recognized as a leading vendor
  - EMC is recognized as a vendor with strong momentum and growth
- EMC will be here to support you

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**where information lives<sup>®</sup>**