Quality of Service Task Force

Service Level Agreements in Enterprise QoS: A Boeing Scenario

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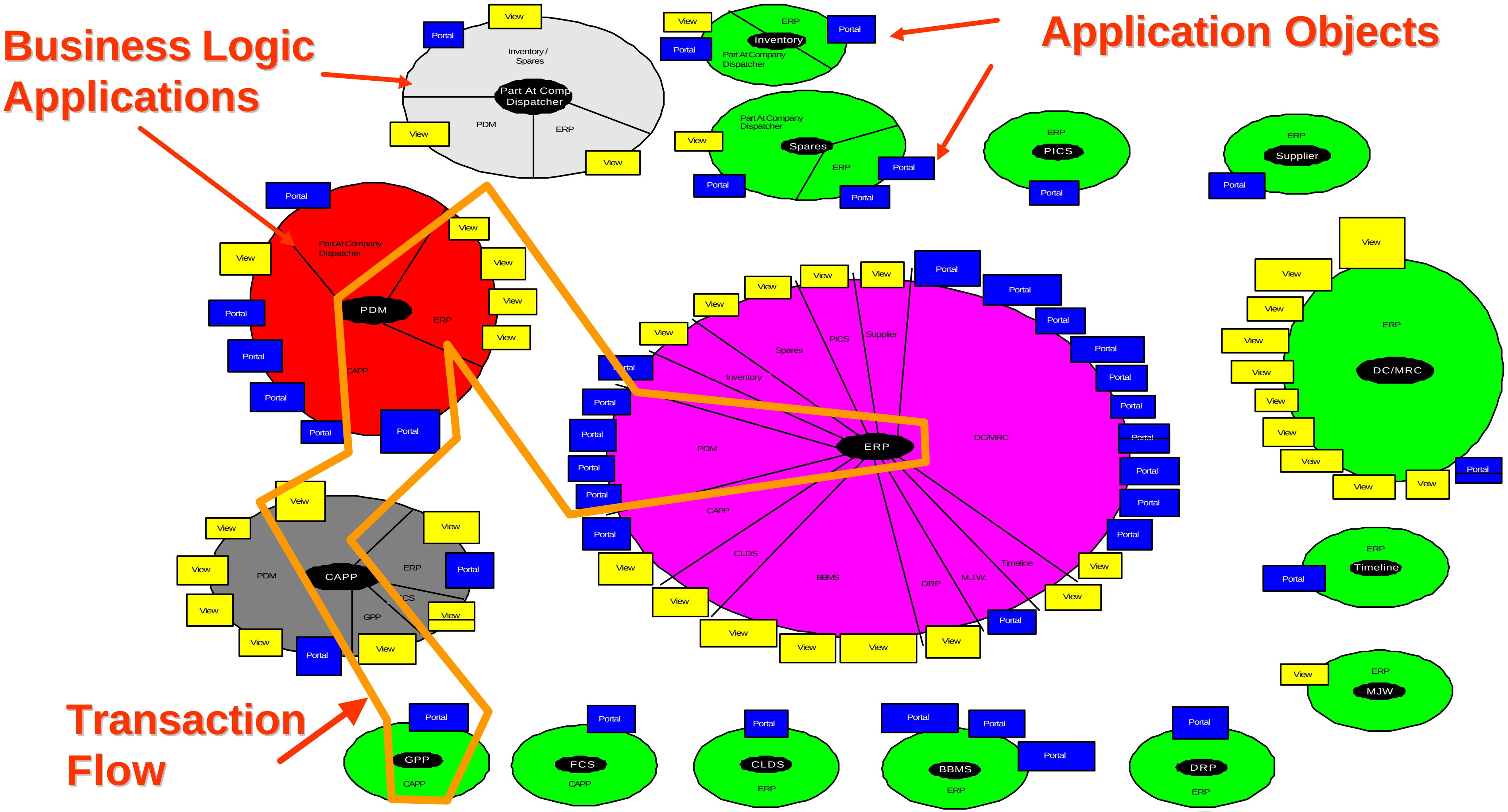
DCAC / MRM Overview

- Integrated collection of (large) applications containing business logic and data
  - Computer-Aided Process Planning (CAPP)
  - Product Data Manager (PDM)
  - Enterprise Resource Planner (ERP)
  - etc.
- Integrated through object wrappers on application functions and an extensive, custom, CORBA-based Application Integration (AI) layer
- Multi-
  - System
  - Site
  - Vendor

DCAC / MRM SLA Environment



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Business Drivers for SLAs

- DCAC/MRM system supports manufacturing operations at multiple sites
- Slow response impacts factory manpower and inventory
  - *"Thou shall not idle the factory floor!"*
- Overall customer satisfaction
  - Service is measurable and actionable
  - Support for IT spend decisions
- Mechanism to quantify IT priorities

SLAs in DCAC / MRM

- SLAs represent agreement between manufacturing users and IT management on acceptable level of transaction response time
  - Enforcement based on percentage of transactions that exceed limit within a stated time period
  - Metrics agreed up front and shared with users
- Focused on top 20% of critical business transactions
  - This still results in 100+ SLAs

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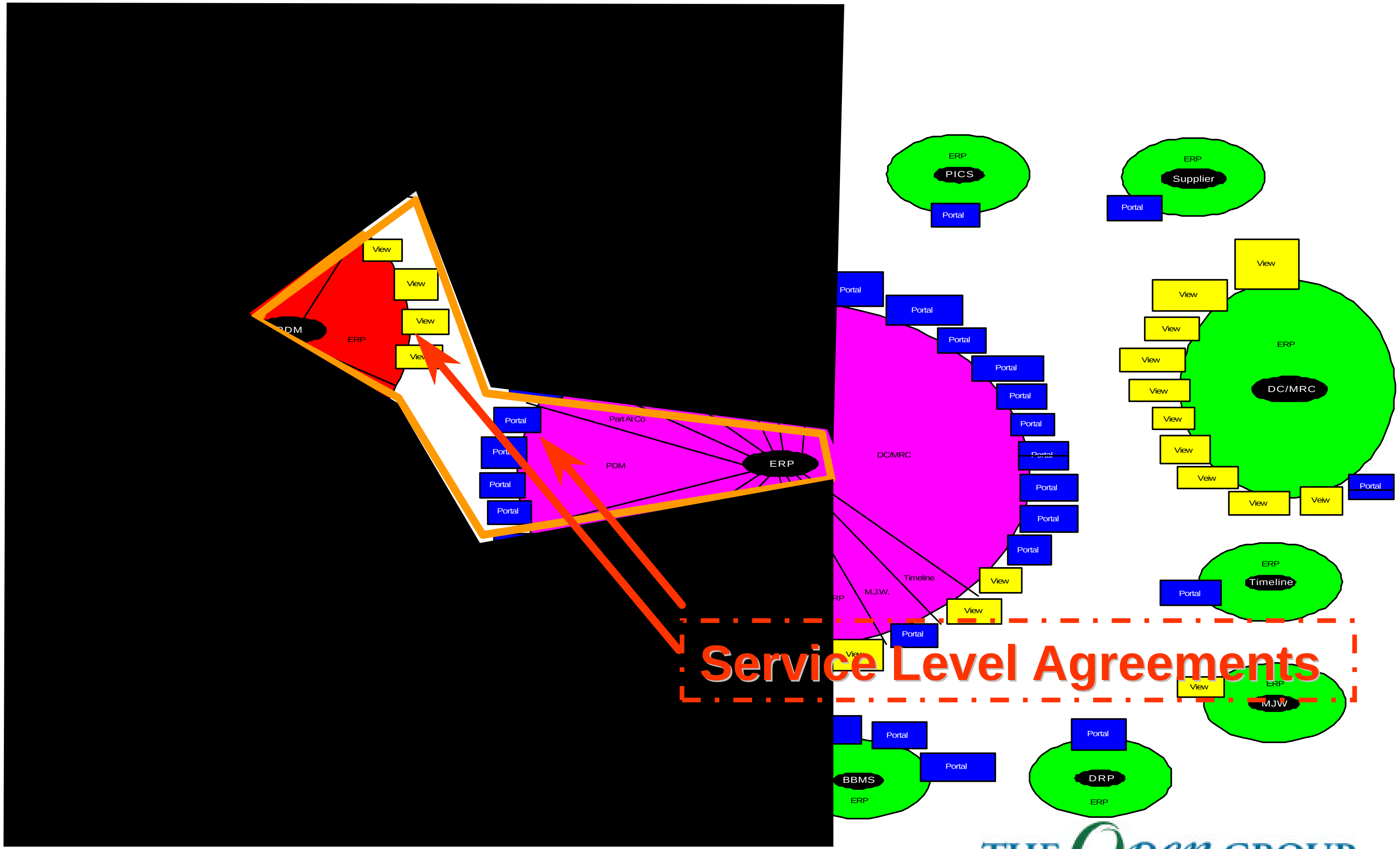
SLAs and Transactions



SLA Policy and Mechanism

- SLA represents performance policy on highest level of transaction
- Performance measurement occurs at component level
- Note components may participate in multiple SLAs
  - Maintaining sufficient context for analysis is significant issue
  - Results in manual process for SLA enforcement

Instrumentation

- Extensive component instrumentation provides mechanism to observe SLA compliance
  - Application components instrumented using ARM to measure transaction start-stop times
  - Contextual data such as network and CPU use also collected
  - Data kept in repository for later analysis
- Commercial tools used for analysis and display
  - OpenView, Measureware

SLAs in Operation

- Users and IT staff monitor compliance using agreed measures
- Users report service problems to IT Help Desk
  - Triage process to dispatch appropriate action
- If analysis shows SLA not being met for 90% of transactions over specified time period, analysis and repair initiated by IT
  - Repairs prioritized by business impact
- SLAs also monitored for 100% compliance
  - May indicate overprovisioning or permissive specification

SLA Issues From Scenario

- While SLAs represent end-to-end path through multiple components, measurements done at component level
  - Limited contextual information, unnecessary differences in data reporting = slow/costly correlation of instrumentation data to reported failure
  - Pushes up cost of Mean Time To Repair
- Gratuitous complexity still a problem

SLA Issues From Scenario

- Different SLAs have different criticality to manufacturing business, however metrics don’t contain sufficient context tags to allow differentiation of transaction flow data
  - Must distinguish critical from non-critical traffic in service restoration
  - Prevents automated resource prioritization or service restoration for critical flows

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Areas for Standardization

Technical Needs	*Standardization Areas*
SLA Specification	• Language and tools for creating and interpreting SLAs
Prioritization of resources	• CPU resource monitoring and control • Network traffic differentiation and prioritization • Mechanisms to pass application prioritization and classification through OS and middleware layers

Areas for Standardization (2)

Technical Needs	*Standardization Areas*
Instrumentation and data collection	• Consistent application performance instrumentation • Metrics at and below middleware layer • Mechanisms for collecting and labeling contextual/situational information for performance and failure data • Mechanisms for tying gathered data to application transaction flow

Areas for Standardization (3)

Technical Needs	*Standardization Areas*
Identification of performance bottlenecks and failures	• Tools for correlation of performance and diagnostic information across multiple platforms • Tools which display end-to-end views of performance, rather than component-focused approach • Cross-platform and cross-resource resource monitoring tools

Areas for Standardization (4)

Technical Needs	*Standardization Areas*
Automation	• Automated collection and reduction of performance, failure and contextual data • Automated mechanisms for prioritized resource reassignment for service restoration

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