Managing a Services-Oriented Architecture

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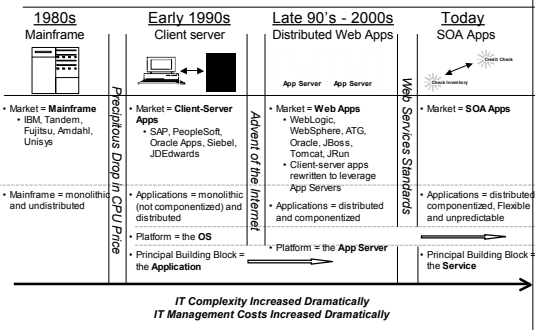
Topics

- Applications are evolving
- New breed of applications
- Application-centric management
- Convergence of applications development and integration
- Cast of characters in the new show!
- Real-time management in the real-time enterprise
- Enterprise Management Bus

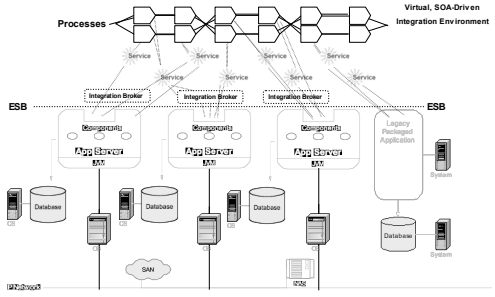
Applications are Evolving



Applications are Evolving

- 2-tier client/server
- 3-tier web-based applications
- Evolving to N-tier: SOA, SOBA , EDA
- Loosely coupled
- Highly complex distributed system with large number of components
- Applications will be comprised of potentially 100s of services, components, interfaces, and connectors distributed across multiple systems

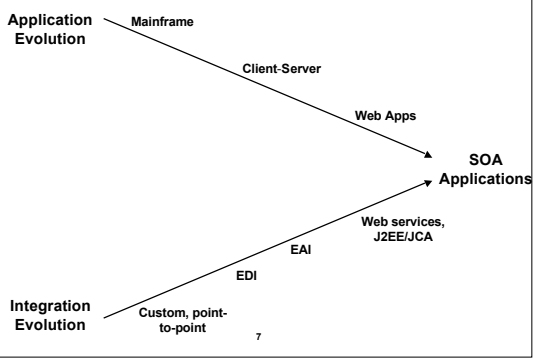
High-Level Application Architecture



New breed of applications moving to production

- Applications are largely becoming an integration of multiple components and services
- SOA, EDA inherently mean integration
- Lack of insight into application inter-dependencies, performance and availability drastically affect business performance

Convergence of Applications and Integration



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Cast of characters in the new show!

Web Servers Application Servers	Process Management Engine Web Services Controllers
Web Services Brokers XML Firewalls	ESB/Integration Brokers Directory Services
Message Oriented Middleware (MOM)	SANs/NAS Directory/Identity Servers
Messaging Systems (SMTP) Wireless enabling Platforms	Database Servers Portals
Integrated Voice Response Systems (IVRs)	Network routers, switches and firewalls

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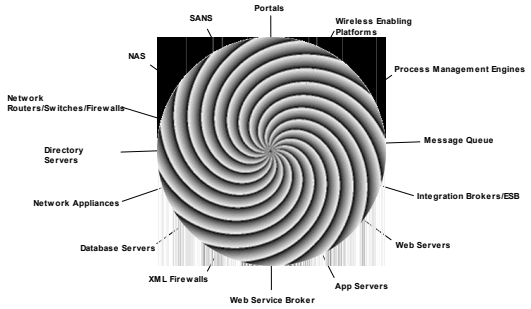
New cast of characters



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But Fundamental High Level Management Needs and Benefits Have Stayed Constant

- Over time, from the days of the mainframe through to today, management needs and benefits have not changed:
  - **F**ault Management
  - **C**onfiguration Management
  - **A**ccounting Management
  - **P**erformance Management
  - **S**ecurity Management
- What has changed in today's world is:
  - ***Increased RISK***: The risks have increased, as business is more reliant on IT than ever before
  - ***Increased COMPLEXITY***: The complexity of IT has increased dramatically
    - Highly distributed with more points of failure
    - Explosion of smaller software components, services, interfaces, with complex, dynamic interdependencies and relationships
    - Within and between enterprises

Business Continuity is dependent on the ability to predict, diagnose, and resolve potential points of failure

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Application-Centric Management

- *It's the application stupid!!*
- Legacy systems & network management tools designed to monitor OS and network components
  - *To "guess" what might happen to the application that is residing on them?!*

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Application-Centric Management

- Application (Services) is the core
- OS and network devices are just some of the resources that applications depend on
- There needs to be a convergence of application, network, and systems management
- Must have fine grain visibility, while monitoring coarse grain services

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Application Instrumentation

- Need to instrument applications to monitor the behavior, availability, and performance of applications in production
- Instrumentation must become a part of the architecture blueprint
- Application instrumentation must start in the design phase before development begins
- Boeing 747!

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Boeing 747

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Boeing 747 Cockpit

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Real-time management in the real-time enterprise

- Real-time enterprise would require real-time management
- Human mediation through consoles makes real-time response meaningless
- Dashboards would become context aware and less important in production
- Building instrumentation in the core architecture framework enables development of micro-level application monitoring utility agents which would enable autonomic computing in a federated context
- You need to move towards autonomic computing: self-healing, self-protecting, self-configuring, self-optimizing (without human mediation!)

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Real-time enterprise

- These micro-level management agents would enable the construction of an enterprise level monitoring infrastructure that is required to effectively “real-time” manage the “real-time” enterprise (federated)
- The collection of these micro-level management agents would create a macro-level enterprise management eco-system
  - Hence instrumentation of the enterprise!

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Enterprise Management Bus

- Enterprise Management Bus (EMB), similar in concept to Enterprise Service Bus, acts as the enterprise central nervous system
- Unified access to applications, systems, and networks management information
- Provide context aware and multi-layer presentation
- Provide a common management information model
- Management abstraction layer
- Must be massively scalable and highly available
- Must be Non-Invasive and non-Intrusive to applications

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