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Migrating SOA to JBoss Enterprise Middleware

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Covad Communications

FAST FACTS

Industry: Telecommunications

Geography: San Jose, California

Profile: Leading provider of integrated voice and data communications. Owns the largest broadband network in U.S. The only solution provider with national footprint, providing data, voice, and wireless telecom solutions to small and medium-sized businesses (SMBs)

Context: Highly advanced and fully automated Operations Support Systems for cash to order – prequalification, order management, network provisioning, billing and network management

Software: JBoss Enterprise Application Platform, JBoss Operations Network

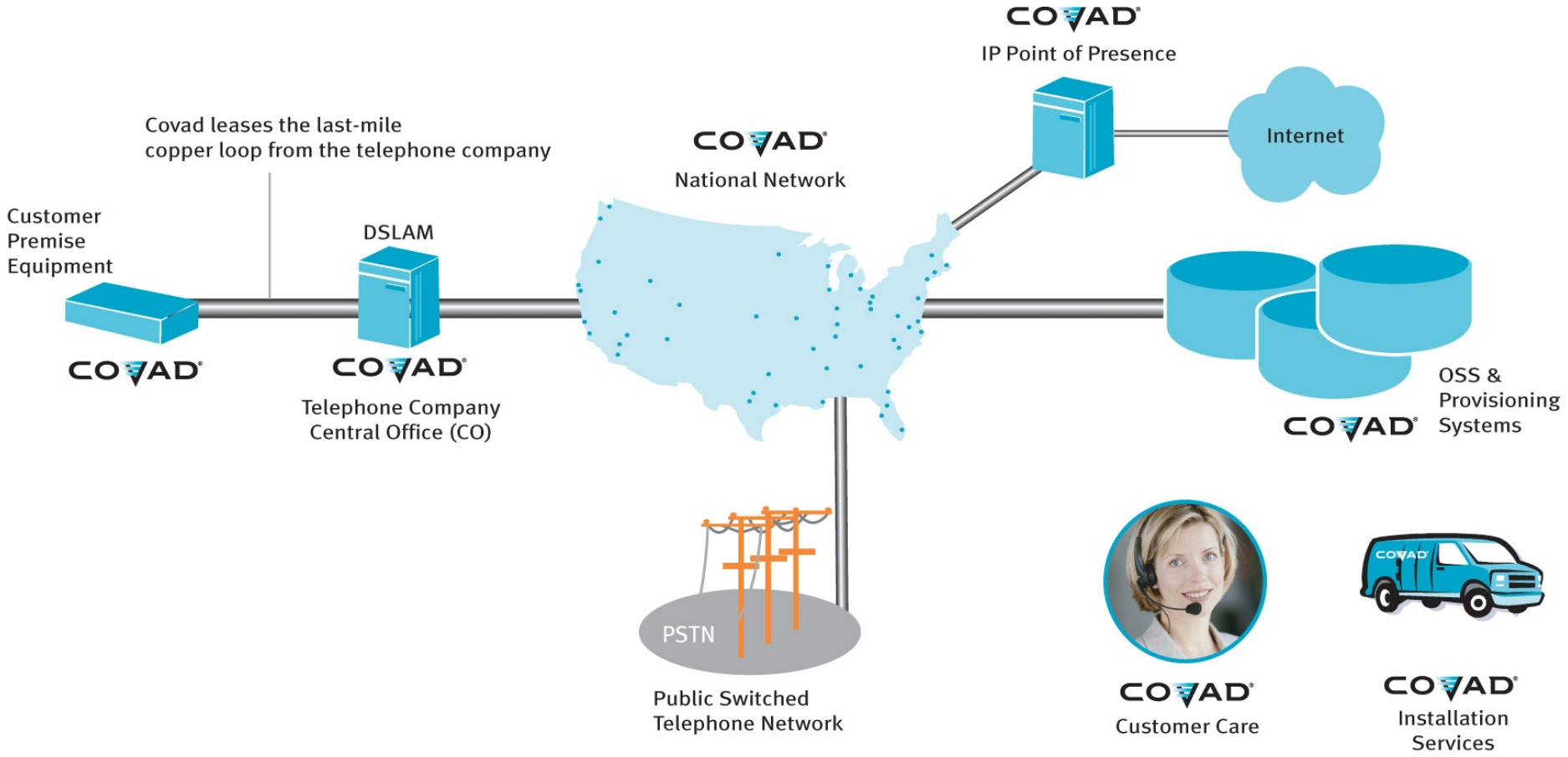
Hardware: Environment – 400 x86 systems. More than 30 production servers running JBoss Enterprise Application Platform today

Opportunity: Transition from inflexible and costly proprietary middleware software to JBoss Enterprise Middleware to cut costs, while speeding launch of new broadband products

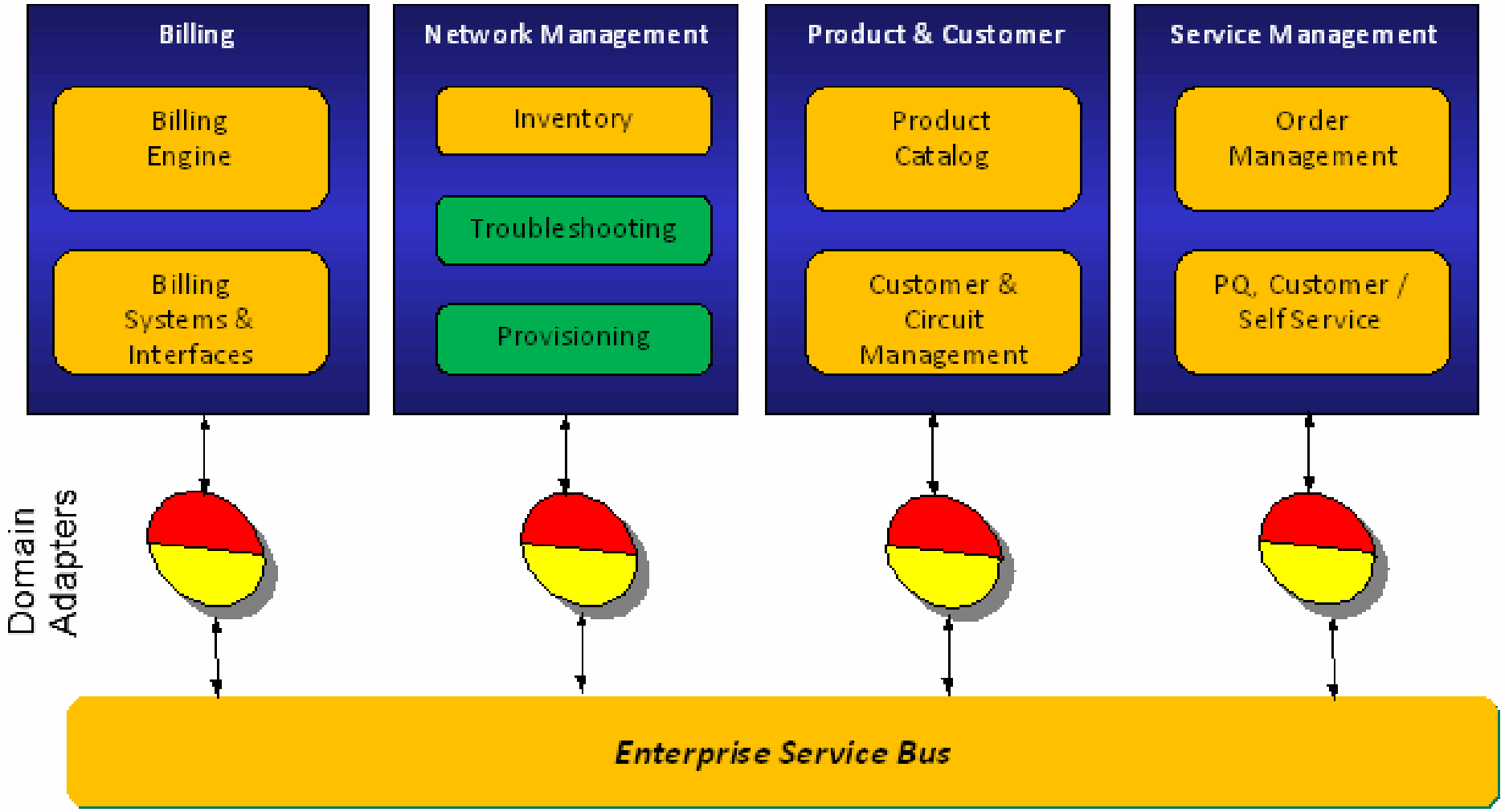
Benefits:

- Costs reduced by more than $500,000 annually in software maintenance
- Enabled cost-effective modernization of service-oriented architecture (SOA)

Covad Operations Overview



Covad Systems - 2007



= Open Source/Home-grown solution

= Expensive proprietary solution

The Objectives

- Management Objectives
  - Reduce IT costs *and* improve systems quality
  - Reduce time-to-market for new products
  - Plan for growth with minimal increase in IT capital expenses
  - Eliminate vendor lock-ins
- Technology Objectives
  - Simplify architecture of Business and Network OSS
  - Improve system uptime
    - Need stability and robustness
    - Need effective monitoring tools
  - Ensure smooth transition across platforms
  - Embrace newer technologies and architectural standards

Management Challenges

- Covad used a proprietary middleware software running on small, distributed servers
  - This middleware software managed very complex billing and operational support systems (BSS/OSS) that supported Covad's broadband wholesale and retail customers and a nationwide network
  - The software maintenance and support costs were prohibitive
  - Licensing terms were inflexible – adding or removing servers was not cost effective
- Application complexity and need for change increased
  - New business lines through acquisitions – integration challenges
  - New product launches – demands of reduction in cycle time

Technology Challenges

- Outdated service-oriented architecture (SOA)
  - Covad implemented SOA in 2003 before most SOA products matured
  - Systems were developed before SOA standards and blueprints were in place
  - By 2008, SOA platform was getting outdated and inflexible
- SOA benefits were not fully realized
  - Many applications remained tightly coupled
  - Application performance became a bigger issue
  - Inter-dependencies were not resolved
    - Deployment dependency problems
    - Run-time dependency problems
  - Product rollouts and system changes were difficult and expensive

The Architect's Toolbox

- Home-grown Solutions
  - Most customizable for company specific business rules
  - Upgrade and maintenance are complex and expensive
- Commercial Off-the-shelf Software
  - Feature-rich due to COTS vendors investing in verticals
  - Quicker ramp-up for users
  - Most expensive – high costs of license and support
- Open Source Software
  - Middleware platforms have evolved – Apache, JBoss, Tomcat
  - Wider industry adoption and better standard compliance
  - Most cost effective and flexible
- Software as a Service (SaaS) Solutions
  - Low maintenance and upgrade costs
  - Least customizable

Approach to Technology Selection

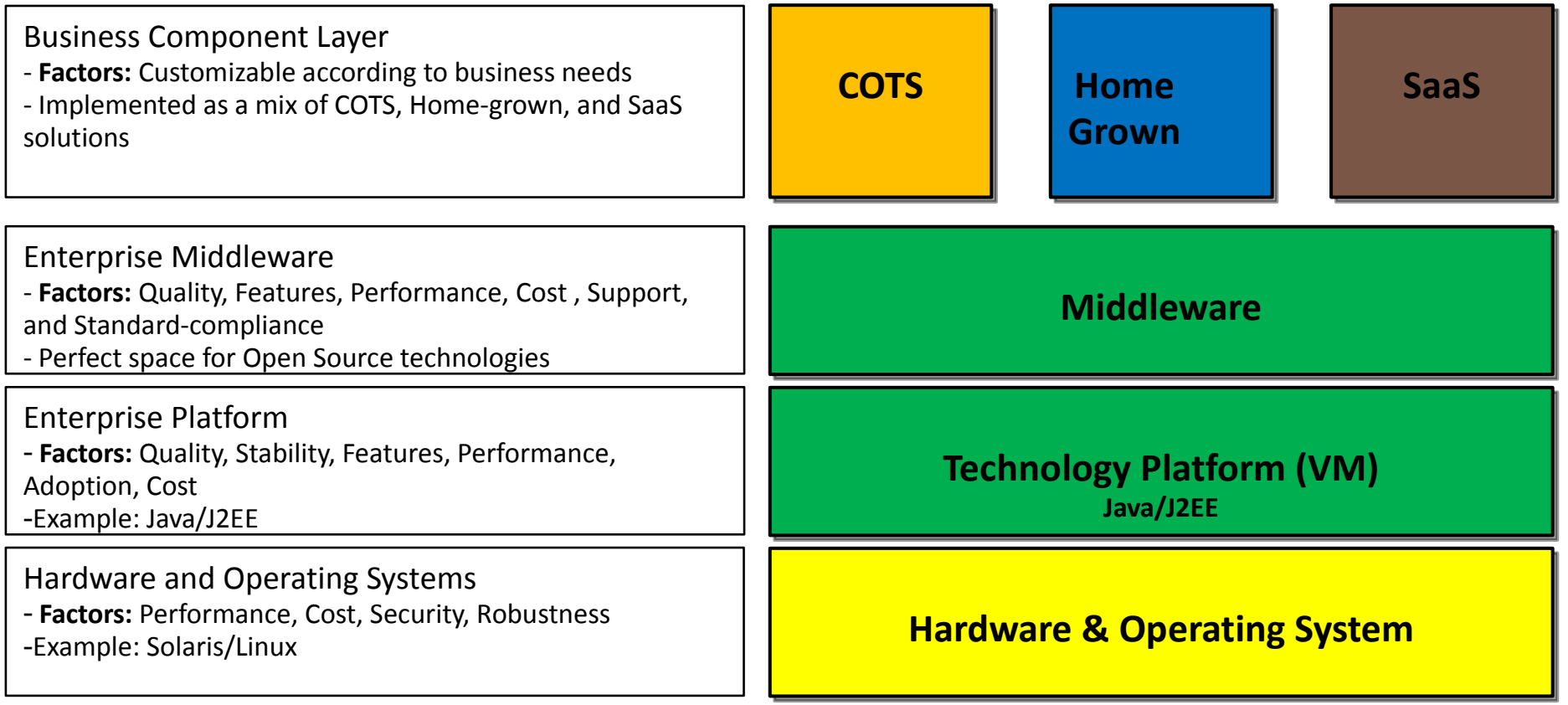
- Proprietary and expensive commercial solutions for domain/industry specific applications
  - *Examples – Billing engines, ERP, network inventory etc.*
- SaaS solutions for generic functionalities
  - *Examples – Agent Commissioning, Billing Reconciliation*
- Home-grown solutions for business components
  - Use appropriate mix of commercial/Open Source technologies
  - *Examples – Order Management, Product Promo Engines*
- Open Source solutions wherever possible!

Approach to Technology Selection

- Open Source solutions for platform and middleware
  - Faster evolution than their proprietary competitors
  - Better customer feedback mechanisms
  - Wider customer adoption, especially through the Internet
  - Proven stability and robustness
  - Better support for standards
  - Widespread user community
    - Better support available through user forums
    - Easy to hire the right skill sets
  - Flexible licensing terms
  - Cost-effective
  - *Examples – Web Servers, Middleware, Object-Relational Mappings (ORM), Portal solutions, etc.*

The Technology Stack

Carefully mix and match the right solutions for the right problems



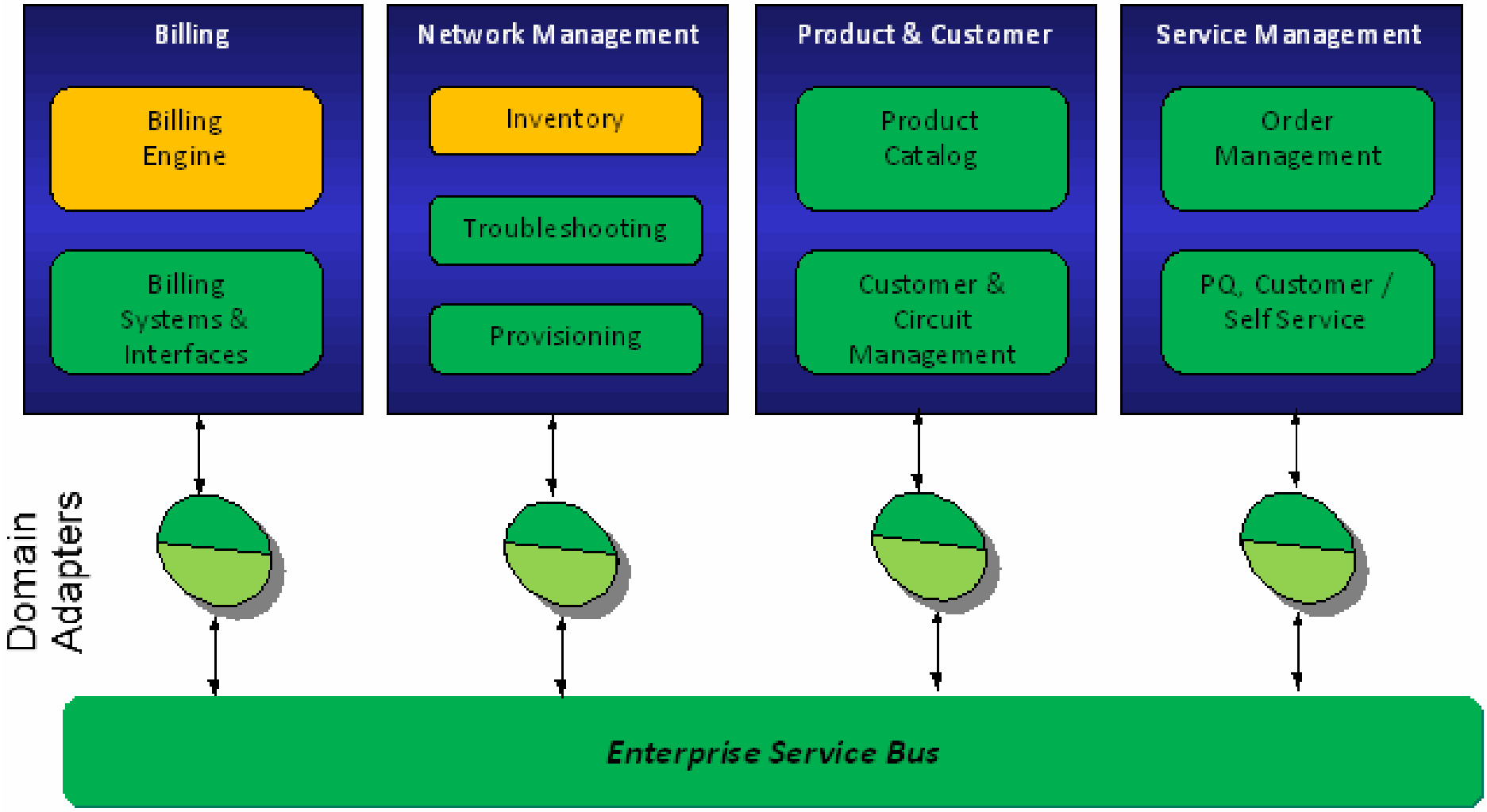
The Solution

- Three-pronged Approach
  - Use of Open Source solutions for middleware, platforms and SOA
    - Use JBoss AS and Tomcat as application and web servers
    - Use Open Source ESB and Rules engines if they meet integration requirements
  - Simplification of SOA to cut application and middleware layers
    - Remove tiers between applications by using domain adapters connected through ESB
    - Remove start-up and run-time dependencies between applications
  - Use of hardware server consolidation and virtualization for license savings and better datacenter management
    - Use Solaris Zones

The Solution (contd.)

- Implementation
  - JBoss Enterprise Application Platform
    - Superior performance
    - Full range of functionality
    - High-quality support
    - Cost-effectiveness
  - Environment
    - Consolidation into 32 x86 machines running JBoss EAP
    - Pilot deployments of JBoss Operations Network
  - ROI Analysis
    - Migration Costs vs. Savings
    - Payback time of 6-8 months!

Covad Systems - 2009



Benefits

- With advanced support for Java Platform Enterprise Edition (JEE), Covad was able to seamlessly migrate over to the JBoss Enterprise Application Platform
- Business users felt no service disruption. Just better performance!
- Covad dropped expensive maintenance contracts for some middleware (some servers remain to be migrated as of August'09)
- Recurring savings of about $500,000 per year on support
- JBoss also enabled Covad to reduce the time-to-market for new services. A new JBoss-based Voice over IP (VoIP) solution was rolled out within four months
- Migration of SOA (ESB and Adapters) is in progress
- JBoss Enterprise Middleware is sure to be a part of the future strategy!

Migration – Tips, Tricks and Traps

- Phase I – Assessment and Planning
  - Is your organization ready for Open Source?
    - Is your usage scenario in compliance with JBoss legal terms?
    - Do you have the necessary skills?
  - What exactly is your TCO?
    - Are your existing apps J2EE-compliant?
    - To what extent are you using proprietary features?
  - What is the best path for migration?
    - In-house? Vendors? JBoss Professional Services?
    - Upgrade or migrate – which comes first?
    - One-shot or phased migration?

Migration – Tips, Tricks and Traps

- Phase II – Preparation
  - Analyze and design the migration process
    - Differences in AS container setup
    - Differences in clustering options
    - External integration points
    - Security – Authentication and Access Control issues
  - Identify traps before migration
    - Use of proprietary packages across systems
    - Features not supported by JBoss
    - Customizations and platform specific features
    - Non-standard descriptors and directory formats

Migration – Tips, Tricks and Traps

- Phase II – Preparation (contd.)
  - Plan to exploit features of new platform
    - Utilize and exploit JBoss features not in your old platform
    - Use the flexibility offered by JBoss. E.g. Web Service Stacks
  - Use JBoss migration resources and tools
    - JBoss MASS (Migration Assistance) Project
    - JBoss migration vendors and services
  - Build in-house skills for execution and maintenance as needed
  - Plan for monitoring and management after deployment
    - JBoss ON Monitoring
    - Integration with your existing tools
  - If needed, sign a support and maintenance contract with JBoss

Migration – Tips, Tricks and Traps

- Phase III - Execution
  - Take a test ride
    - Put a few JBoss components live as proof-of-concept
    - Figure out the exact JBoss configuration that works for you
  - Resolve interplay issues
    - Not all “standard-based” systems work well with each other
    - Not all web service stacks and ORM mechanisms are equal
  - Set up the containers
    - Download EAP software for free!
    - Set up container and clusters as necessary
  - Automate migration if necessary
    - XML Deployment descriptors
    - Container setup scripts

Migration – Tips, Tricks and Traps

- Phase III Execution (contd.)
  - Update resource parameters
    - JBoss Datasource migration (java:/mydatasource)
    - JMS queues/topics migration
    - Naming context factory
    - Transaction parameters (CMP/BMP)
    - Cluster URL's
  - Well written J2EE *code* ports without changes!
  - Go Live! Deploy and Run
  - Tune the deployments till you get them right
  - Use JBoss ON
    - Inventory and auto-discovery
    - Monitoring
    - Configuration and control

Resources

- Covad Communications
  - http://www.covad.com – Corporate Website
  - http://twitter.com/covad – Twitter page
  - http://xlink.covad.com – XML-based B2B Interface
- Covad's Use of Open Source
  - http://www.billingworld.com/articles/covads-man-in-the-middle.html
  - http://www.telephonyworld.com/news/covad-communications-improves-voip-and-broadband-time-to-market-with-jboss-/
- JBoss Migration Resources
  - http://www.redhat.com/promo/migration

QUESTIONS?

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Thank You!