An Introduction to Enterprise Architecture and Oracle
The following is intended to outline our general product and services direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing or implementation decisions. The development, release, and timing of any features or functionality described for Oracle’s products or services remains at the sole discretion of Oracle.

Reference architecture and other EA artifacts screen shots are continuously undergoing refinement. To further understand and make use of the most up-to-date information contained herein, please contact an Oracle representative.
Business and IT Transformation
Success Requires Partnership

**BUSINESS DYNAMICS**
- Growth, M&A, Globalization
- Innovation & Operational Agility
- Efficiency & Cost Controls

**IT INDUSTRY DYNAMICS**
- Next Generation Applications
- IT Optimization
- Cloud Computing
Business Dynamics Have Evolved

**From Silos**
- Process Automation
- Individual Productivity
- Data Capture & Reporting
- Secure Access & Audit
- Local Optimization
- Cost Reduction
- Innovation

**To Enterprise-wide**
- End-to-End Business Integration
- Business Agility
- Collaboration & Performance Mgmt
- Governance, Risk, Compliance
- Global Process Standards
- Cost Reduction
- Innovation
IT Strategy Continues to Evolve
From Increased Accountability to Business Value

• Holistic View of Business Strategy and Technology
  – Address complexity: rationalize, standardize, consolidate, optimize
  – Design in: Governance, sustainability, flexibility

• Delivers a Practical Path to Innovation
  – Technical and operational roadmaps for business and IT
  – Business-driven transition plans
A Practical Approach

Establish a formal business context to drive and constrain the architecture vision. Leverage the current state and develop an iterative path to the future state. Design a business-results oriented roadmap that is transparent, measurable, and considers organizational change, acceptance, and refinement.
Oracle EA Guiding Principles

Agility and Sustainability

Business Driven

Forward Thinking

Time to Value

Best Practices
Focused on an Optimized IT Core

Based On...

- Architectural Principles
- Best Practice & Reference Architectures
- Industry & Corporate Standards
- Technology Trends
- Business Model, Strategy & Objectives
- Rationalized IT Portfolio
Oracle EA Scope – Optimized IT Core

User Interaction
- Applications
- Collaboration
- Analytics
- Content & Search

Composite Business Processes

Application Services
- ERP
- Human Resources
- CRM
- Industry & Other

Technology Foundation
- Business Integration
- Intelligence & Analytics
- Security & Compliance
- Computing Platform
- Data & Content
- Application Development
- Enterprise Management

Copyright ©2011 Oracle Corporation. All rights reserved.
Oracle’s “Practical” Approach

People
Oracle Enterprise Architects

Process
Oracle Architecture Development Process

Portfolio
Oracle EA Framework

- Business Architecture
- Application Architecture
- Information Architecture
- Technology Architecture
- Enterprise Architecture Governance

Enterprise Architecture Repository
People

Oracle Enterprise Architects

- Proven business and technology leaders
- Navigate end-to-end Oracle portfolio and beyond
- EA training and certification in Oracle and industry standards

Certified Architects, Experienced Advisors
Oracle Architecture Development Process

Process

Practical Approach, Proven Methodology

Aligns with customer and industry standard EA frameworks

Iterative
Agile EA Approach

Reuses best practice business models and reference architectures

Provides Governance
Best Practices, Proven EA Artifacts

• Best Practice Reference Architectures
• Reduces Architecture/Solution Development Time
Oracle EA Services Portfolio

Ensures Alignment & Optimization of IT Investments

Oracle Architecture Center of Excellence

EA Strategy & Planning

Application Strategy & Roadmap

Information Management & Governance

IT Optimization & Cloud Computing
### Oracle EA Services Engagements

#### Enterprise Architecture Methods
- Refine EA role & responsibility
- Organize overall accountability
- Bridge business & IT strategy

#### Business Architecture
- Refine capability models and metrics
- Connect business model to EA vision
- Guide industry best practices

#### Information Architecture
- Re-engineer core business processes
- Master data management
- Improve analytics & information quality

#### Applications Architecture
- Rationalize portfolio & roadmaps
- Guide services, EDA & BPM strategy
- Applications evolution roadmap

#### Governance Architecture
- Establish processes & metrics
- Oversee governance operations

#### Technical Architecture
- Server consolidation (RAC-Exadata)
- Enterprise security (DB-Identity)
- IT-as-a-Service (DB-aaS, PaaS, IaaS)
Architecture Center of Excellence

Delivers Consistent EA Execution

- Across Projects
- Across Technology
- Across Teams
“The output was fantastic. I have to admit I was skeptical that a vendor could do an impartial review of our IT architecture that didn’t evolve into a sales pitch. This was an extremely professional and worthwhile exercise that has changed our perception of Oracle as a partner and not just a vendor.”
Oracle EA In Action

Oracle Architecture Development Process

Oracle Enterprise Architecture Framework

Oracle Reference Architectures
Oracle EA In Action

Oracle Architecture Development Process
Current State

Oracle Architecture Development Process

Consolidation and Standardization Phases:
- First Phase
- Second Phase
- Future
- Not Considered

Vision and Mission

Business Domains
- Constituent Svcs
- Justice
- Resource Mgmt
- Govt Ops
- Education

IT Service Delivery Model & Consolidation Phases

Oracle Architecture Development Process

Copyright ©2011 Oracle Corporation. All rights reserved.
Future State

Oracle Architecture Development Process

Oracle Enterprise Manager and Ops Center
Billing and Revenue Management

IT Service Management

Load Balancer
FMW-as-a-Service
Database-as-a-Service
Infrastructure-as-a-Service
Exadata

Oracle Virtual Assembly Builder

Oracle Architecture
Development Process

Business Case
Current State
Future State
Enterprise Architecture Repository
Strategic Roadmap
Architecture Vision

User
Service Request
Provisioning
Chargeback
Future State

Oracle Architecture Development Process

People & Process
- Provisioning
  - Policy Management
- Charge-Back
  - Configuration Management

Software as a Service
- Sun Blades running: SHARE Enterprise BI & CM & IDM
- Cisco UCS running: Email

Platform as a Service
- Application Grid on Sun Blades with Hypervisor
- Exadata with Virtual Private Database Cloud
  - Oracle Enterprise Linux
  - Exadata Storage Cells

Infrastructure as a Service
- Sun Blades running: Oracle DB, SQL Server
- Sun Blades with Hypervisor: Solaris, Linux, Windows
- Oracle DB Options
- OS Monitoring & Diagnostics
- Storage Monitoring & Diagnostics
- Network Monitoring & Diagnostics

Network
- Hitachi SAN
Strategic Roadmap

Oracle Architecture Development Process

Oracle Enterprise Linux

Exadata: Small, Medium, Large Database Configurations
Enterprise Architecture Governance

Service Strategy
- Service Portfolio Management
- Financial Management

Service Design
- Service Catalog Management
- Security Management
- Service Level Management
- Continuity, Availability, & Capacity Mgmt

Service Transition
- Release and Deployment Management
- Asset & Configuration Management
- Change Management

Service Operation
- Incident & Problem Management
- Event Management
- Service Request Management

Continual Service Improvement
- Service Measurement
- Service Reporting

Oracle Architecture Development Process
Oracle EA In Action

Oracle Enterprise Architecture Framework
Establishing an EA Roadmap

*EA Observations and Analysis*

- Business Architecture
- Application Architecture
- Information Architecture
- Technology Architecture

*Oracle Enterprise Architecture Framework*
An Example: Complete Architecture Vision

Business Strategy
- Mergers & Acquisitions
- Operational Excellence
- Corporate Governance
- Innovation

Operations
- Enterprise Resources
- Supply Chain
- Human Capital
- Customer Relations
- Enterprise Performance
- Industry Processes

0101's Information
- Customers
- Products
- Suppliers
- Sites

Technology
- User Interface
- Middleware
- Database
- OS & VM
- Servers
- Storage

Management

Governance
# Current State Summary

## Business Goals
- Provide Better Customer Service in growing markets
- Operational Efficiency at lower cost

## Organization Structure
- Company
  - Business Services
  - Product Division A
  - Product Division B
  - IT Services

## Business

### Applications
- After corporate re-structuring, all major applications are Integrated.
- Need Portfolio Rationalization as a roadmap to Fusion Apps
- Unable to meet Performance SLA
- Lack of Real-Time Reporting

### Information
- Data Integration – Lack of ETL standards, MDM/Data Cleansing Strategy, 2 hour batch window for e-Commerce to back end
- Reporting/BI – Multiple reporting tools, Ad-hoc reporting off Transactional systems impacts performance, Lack of Daily BI
- Content Management – No CMS; Large data growth in transactional systems as a result of storing unstructured documents
- Portal – Oracle Portal for internal and external – Ziorly static content, not very customizable; Custom J2EE for e-Commerce

## Technology
- Middleware – 3 App Servers (OAS, JBoss, Silverstream); BPEL 10g used with B2B for data integration/ transformation
- Database - Oracle 10g for EBS – 2 environments to support Reporting/Archiving; 8.1.7 for PSFT; HA is Active-Passive
- Operations – EM Grid Control, Quest used for db monitoring, Problem diagnostics/resolution is reactive, Lack of load/functional testing tools, Isolating performance issues down to specific applications/modules is time consuming
- Infrastructure – EBS running on PRIMEPOWER 850 server (32-cores) running SPARC64/Solaris; Heavily loaded with >75% utilization; Need to provide elastic scalability

## Core Applications
- Front Office: SFDC, Oracle Service Management
- Back Office: Oracle ERP (Financials + HCM), Supply Chain Management

## Key Processes
- Lead-To-Service Engagement
- Lead-To-Order
- Order-To-Ship
- Call-To-Resolution

## Gaps
- Employee Self-Service for HR
- Project Portfolio and Resource Mgmt.
- EPM
Future State Summary

Business Goals
- Provide Better Customer Service in growing markets
- Operational Efficiency at lower cost

Organization Structure

Key Processes
- Lead-To-Service Engagement
- Lead-To-Order
- Order-To-Ship
- Call-To-Resolution

Core Applications
- Front Office: SFDC, Oracle Service Management
- Back Office: Oracle ERP (Financials + HCM), Supply Chain Management

New Capabilities
- Employee Self-Service Portal
- EPM
- Project Portfolio and Resource Mgmt.

Business

Applications
- Meet/Exceed Performance SLAs (eg. offloading reporting from transactional Apps, shrinking 2hr batch, real-time reporting)
- Fusion Applications adopted after rationalizing current portfolio.

Information
- Data Integration – Well Defined ETL Strategy - ODI Suite for ETL/Data Cleansing and reducing batch windows, MDM
- Reporting/BI – Standardize OBIEE, Offload Querying using Golden Gate Replication, Daily BI/Scorecards
- Content Management – Externalize unstructured content to Oracle UCM; Automate paper-based document workflows with IPM
- Portal – WebCenter for internal, external, E-Commerce portals – personalization, dynamic content, process, collaboration
- Security / Identity & Access Management – Right people have right access to the right information at the right time (encrypt/mask sensitive data using technologies like TDE and Data Masking)

Technology

Standardize Technology Architecture

- Middleware – Consolidate multiple Application Servers to WebLogic Server that serves as a foundation for the Application Grid.
- Database - Upgrade EBS to Oracle 11g and leverage capabilities like Advanced Compression, Database Grid - RAC for Active-Active HA, ASM
- Management – Consolidate management tools to Enterprise Manager for Application-To-Database monitoring and diagnostics, Proactively resolve problems by defining SLAs in EM and get alerted when thresholds exceed limits (eg: RUEI, Java Diagnostics), Use Oracle Application Testing Suite for Load/Functional Testing

Business Services
Product Division A
Product Division B
IT Services
Prioritized EA Initiatives

Roadmap

(Phase 1)
1. EBS Query offloading using Golden Gate replication to improve performance
2. Upgrade EBS to 11g to leverage capabilities like Advanced Compression
3. Deploy EBS on Database Grid Architecture
4. Enterprise Manager for Application-To-Database monitoring and diagnostics
5. Standardize on Oracle BI Foundation for Enterprise Reporting and EPM
6. Oracle Service Management Application performance tuning / health check
7. Enterprise Manager for Application Quality Management (Load/Functional Testing)
8. Externalize unstructured content to Oracle Enterprise Content Management
9. Add Project Portfolio and Resource Management capabilities
10. HR Application portfolio rationalization
11. Web Content Management to manage Software Downloads

(Phase 2)
12. Consolidate/Standardize to WebLogic Server Application Grid platform
13. WebCenter for internal, external, E-Commerce portals
14. Upgrade to SOA 11g and evolve to a more mature SOA Architecture (batch-based to SOA-based)
15. Automate paper-based document workflows using IPM
16. ODI for ETL/Data Cleansing and reducing batch windows

(Phase 3)
17. Encrypt/Mask sensitive data using data masking and Transparent Data Encryption
18. Focused Security/IDM Insight
<table>
<thead>
<tr>
<th>#</th>
<th>Technology Focus Area</th>
<th>Technology Benefits</th>
<th>Business Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EBS Query offloading using Golden Gate replication</td>
<td>Improve OLTP Performance</td>
<td>• Better Customer Experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Real-Time Reporting for Better Business Insight</td>
</tr>
<tr>
<td>2</td>
<td>Upgrade EBS database to 11g</td>
<td>Leverage new capabilities like Advanced Compression and get better performance</td>
<td>• Better Customer Experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Reduce Storage Costs</td>
</tr>
<tr>
<td>3</td>
<td>Deploy EBS on Database Grid Architecture</td>
<td>High Availability, Elastic Scalability</td>
<td>Business Agility – add capacity on demand</td>
</tr>
<tr>
<td>4</td>
<td>Enterprise Manager for Application-To-Database monitoring</td>
<td>Single pane of glass to monitor and diagnose problems from Apps down to Database</td>
<td>Operational Efficiency at Lower Cost</td>
</tr>
<tr>
<td></td>
<td>and diagnostics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Standardize on Oracle BI Foundation for Enterprise Reporting</td>
<td>Common Enterprise Information model for all data sources for Reporting and Analytics</td>
<td>Better Business Insight with Daily BI, Analytics</td>
</tr>
<tr>
<td></td>
<td>and EPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Oracle Service Management Application performance tuning /</td>
<td>Application Performance Tuning</td>
<td>Better Customer Experience for Call-To-Resolution</td>
</tr>
<tr>
<td></td>
<td>health check</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Enterprise Manager for Application Quality Management (Load/</td>
<td>Ensure Application Quality and Performance with end-to-end application testing</td>
<td>Better Customer Experience</td>
</tr>
<tr>
<td></td>
<td>Functional Testing)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Externalize unstructured content to Oracle Enterprise</td>
<td>Better manage the growth of unstructured content like POs, Invoices etc outside the</td>
<td>Operational Efficiency at Lower Cost</td>
</tr>
<tr>
<td></td>
<td>Content Management</td>
<td>core application db</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Add Project Portfolio and Resource Management capabilities</td>
<td>Fill in a functional gap</td>
<td>Better Customer Experience</td>
</tr>
<tr>
<td>10</td>
<td>HR Application portfolio rationalization</td>
<td>Standardize /Simplify the core HR applications</td>
<td>Enhance Employee Productivity</td>
</tr>
<tr>
<td>11</td>
<td>Web Content Mgmt to manage Software Downloads</td>
<td>Retire Novell Director that is being EOL</td>
<td>Better Customer Experience</td>
</tr>
<tr>
<td>12</td>
<td>Consolidate/Standardize to WebLogic Server Application Grid</td>
<td>• Reliability, Availability, Scalability, Performance</td>
<td>Reduced Operational Cost, Elastic Scalability</td>
</tr>
<tr>
<td></td>
<td>platform</td>
<td>• Foundation for Fusion Apps</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>WebCenter for internal, external, E-Commerce portals</td>
<td>Personalization, Dynamic content, Collaboration</td>
<td>Employee Productivity, Customer Experience</td>
</tr>
<tr>
<td>14</td>
<td>Upgrade to SOA 11g and evolve to a more mature SOA architecture</td>
<td>Move from batch to real-time shrinking the batch windows from e-commerce to back-end systems</td>
<td>Better Customer Experience</td>
</tr>
<tr>
<td>15</td>
<td>Automate paper-based document workflows using IPM</td>
<td>Automate the image capture and workflow associated with paper-based documents like</td>
<td>Operational Efficiency at Lower Cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Invoices</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>ODI for ETL/Data Cleansing and reducing batch windows</td>
<td>• EL-T based data movement provides better performance</td>
<td>Better Customer Experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Data Integrity, Cleansing, Enrichment (eg Customer)</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Encrypt/Mask sensitive data using data masking and Transparent</td>
<td>Non-production environments have access to meaningful masked sensitive data like SSN</td>
<td>Compliance – SOX, PCI</td>
</tr>
<tr>
<td></td>
<td>Data Encryption</td>
<td>with referential integrity</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Focused Security/IDM Insight</td>
<td>Sample capability: self-service password resets</td>
<td>Enhance employee productivity</td>
</tr>
</tbody>
</table>
Leverage Proven Artifacts

Start with EA Principles

---

**Principle Map**

**Information as an Asset**
Information needs to be managed and treated the same way as physical asset.

**Value and Risk Classification**
A classification of an information asset's value and risk should be the foundation on which its management and governance is based.

**Single Version of Truth**
Data should only be collected once electronically within a single interface, and shared across systems.

**Minimum Quality**
Quality requirement needs to be set for information assets.

**Information has Authoritative Sources**
All business data needs to have an authoritative source.

**Information Security**
Information needs to be secure throughout its lifecycle.

**Information Accessibility**
Information is accessible for users to perform their functions.

**Data Stewardship**
Every data item has one person or role as ultimate custodian.

**Metadata Driven**
Information architecture needs to be metadata driven.

**Measurement for Quality**
Quality of data will be measured.

---

Example: Information Architecture Project
Leverage Proven Architectures

CURRENT STATE ARCHITECTURE BASELINE

FUTURE STATE ARCHITECTURE MODEL

DESCRIPTION

What:
The Future State Architecture Model is a logical end-to-end view of business, application, information, technology and their relationships. Along with the Current State Architecture Baseline, it is the basis for transition planning.

Who:
This is used by IT to provide an overview of the horizon state.

Key Messages:
The Future State Architecture Model shows:
- Enhanced and simplified application portfolio that better meets business needs
- Data integration needs addressed with a modern, message-based architecture that improves data quality and timeliness
- Master data management for the core information assets that improves data consistency
- Reduction in variety of both databases and application platforms leading to improved operational efficiencies
- Integrated security technology with improved operational efficiencies
- Improved controls through enhanced architecture governance processes.

References:
N/A

Additional Content:
N/A
Business Architecture

Example: Capability Model for Retail

<table>
<thead>
<tr>
<th>Analytics</th>
<th>CRM &amp; Marketing</th>
<th>Business Operations</th>
<th>Corporate Administration</th>
<th>Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Demand &amp; Enterprise</td>
<td>Loyalty</td>
<td>Supply Chain Planning</td>
<td>EPM</td>
<td>Integration and Collaboration</td>
</tr>
<tr>
<td>Web Store</td>
<td>Call Center</td>
<td>Supply Chain Execution</td>
<td>Financials</td>
<td>Servers, Storage, Networks</td>
</tr>
<tr>
<td>Marketing</td>
<td>Sales</td>
<td>Merchandise Planning &amp; Optimization</td>
<td>Human Resources</td>
<td></td>
</tr>
<tr>
<td>Order Mgmt</td>
<td>Pricing</td>
<td>Merchandise Operations</td>
<td>Real Estate</td>
<td></td>
</tr>
<tr>
<td>Pricing</td>
<td>CTO</td>
<td>Store Operations</td>
<td>Helpdesk</td>
<td></td>
</tr>
</tbody>
</table>

- **Business Operations**
  - Supply Chain Planning
    - Replenishment Optimization
    - Advance Inventory Planning
    - Supply Network Optimization
    - Value Chain Collaboration
    - Value Chain Allocation
  - Supply Chain Execution
    - PIM
    - Sourcing
    - Warehouse Management
    - Transportation Management
    - Home Delivery
  - Merchandise Planning & Optimization
    - Merchandise Financial Planning
    - Assortment Planning
    - Item Planning
    - Category Mgmt
    - Price Optimization
    - Promotion Planning & Optimization
    - Demand Forecasting
  - Merchandise Operations
    - Trade Management
    - Invoice Match
    - Returns Management
    - Merchandise Management
    - Price Management
    - Sales Audit
  - Store Operations
    - Point-of-Sale
    - Store Inventory Mgmt
    - Workforce Scheduling
    - Learning Mgmt
    - Store Helpdesk
    - Workforce Comms

- **Corporate Administration**
  - EPM
  - Indirect Procurement
  - Financials
  - Projects
  - Human Resources
  - Compensation
  - Real Estate
  - Helpdesk
  - HR
  - IT
Applications Architecture

Industry Process Repository

7. EA Repository

Cross Industry Processes
Information Architecture

Oracle Reference Architecture
Technical Architecture

Oracle Reference Architecture
# Governance Architecture

*Design-In Transparency, Accountability, and Governance*

## People Element

#### Key Questions

## Policy Element

#### Key Questions

## Process Element

#### Definition

## Technology Element

#### Key Questions

### Financial Element

<table>
<thead>
<tr>
<th>Key Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding Model</td>
</tr>
<tr>
<td>How is the Information Architecture Funded?</td>
</tr>
<tr>
<td>ROI Monitoring</td>
</tr>
<tr>
<td>How is the Return on Investment for the Information Architecture monitored?</td>
</tr>
<tr>
<td>Financial Auditing</td>
</tr>
<tr>
<td>How do we audit the finances associated with an Information Architecture?</td>
</tr>
</tbody>
</table>
Oracle Reference Architectures
“IT Strategies from Oracle”
What is it?

• A reference library of EA and solution architectures
  – Written by Oracle architects
  – Endorsed by Oracle product development

• Reference architectures covering Oracle products
  – Yet, product and vendor neutral
  – Spans horizontal technology and industry verticals
  – Includes Oracle product mapping

• Pragmatic guidance and approaches for applying important technology strategies
  – SOA, BPM, EDA, …
“IT Strategies from Oracle”

How can you use it?

• Helps organize the complex product landscape
  – Cross-product reference architecture
  – Augments product documentation

• Holistic approach to technology adoption
  – Not just a tactical product deployment
  – Increase your understanding, capability, and competency

• Reduces risk
  – Proven architecture, proven solution approach

• It’s Free!
  – Free download at: www.oracle.com/goto/itstrategies
“Mastering enterprise-class architecture requires experience in organizational politics, governance, as well as sophisticated technology patterns. The IT Strategy reference library provides essential perspectives to being successful at all three.”

Amit Zavery
VP Product Management, Oracle Development
A Formal EA Program…

✓ Enables Business & IT Alignment

✓ Reduces Business & IT Costs and Risk

✓ Speeds Time to Implementation
How Oracle Can Help

Leverage Oracle’s Portfolio of EA Assets

**People**
Certified Architects, Experienced Advisors

**Process**
Practical Approach, Proven Methodology

**Portfolio**
Best Practices, Proven EA Artifacts
To Learn More

• Visit the Oracle Technology Network (OTN) Architect Center on oracle.com
  – www.oracle.com/goto/EA-Welcome

• Use our EA & Architecture Artifacts
  – www.oracle.com/goto/itstrategies

• Blog along with our Oracle Enterprise Architects at blogs.oracle.com

• Attend Oracle EA and Architect Events

• Learn about Oracle EA Services
  – www.oracle.com/goto/EA-Services
Hardware and Software

Engineered to Work Together