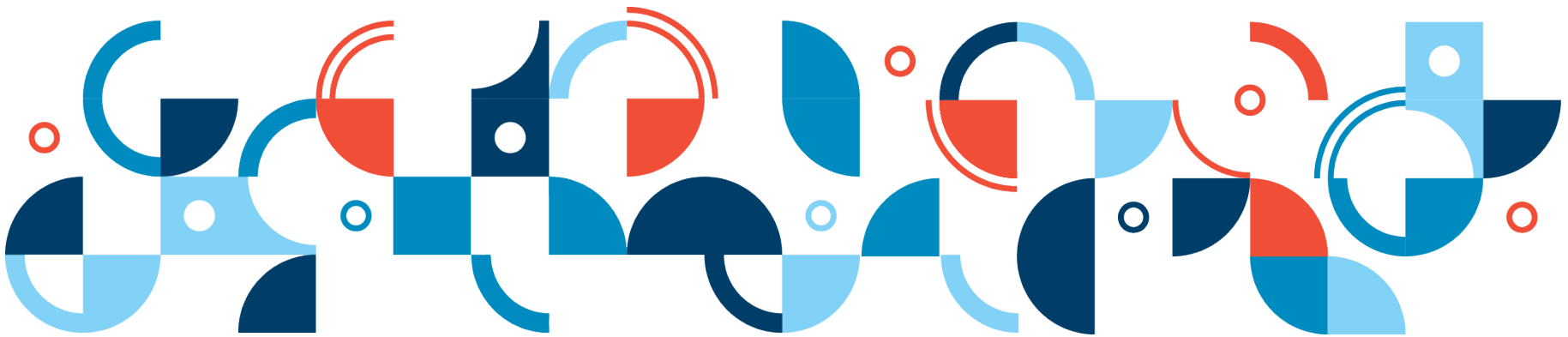Astrid Kreissig, Senior Technical Staff Member, kloss@de.ibm.com

Software Defined Environments (SDE)

Shift in the Cloud Marketplace – Emergence of new, highly iterative models to deliver customer interaction

Optimization
Reduce Cost, Improve flexibility

Paul the provider

Innovation
Rapidly Add Business Value

Colin the consumer

Software Defined Environment

Cloud Operating Environment

API Economy

### Focus on Operational Costs

- Consolidation (solutions & infrastructure)
- Operations Automation (reduce skills & risk)
  - Move from manual policy enforcement to analytics driven enforcement & optimization

Focus on Speed and Agility

- Assemble solutions from verified software components & services
- Fast deployment & redeployment of infrastructure resources using Software Defined Environments

- Dev / Ops process enables fast iterative development

2

What are Software Defined Environments?

Software .... Abstracted and virtualized IT infrastructure resources managed by **software**

Defined

Environments .... Workloads that **define** infrastructure requirements and configuration

.... IT infrastructure that extends multiple **environments** to go beyond the data center

Workload Aware

| Definition | Patterns | Analytics |

Resource Smart

| Compute | Storage | Network |
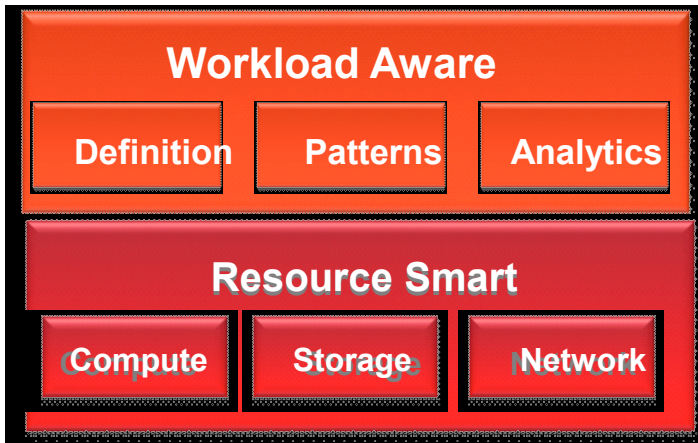
With IBM's Software Defined Environment, infrastructure is fully programmable to rapidly deploy workloads on optimal resources and to instantly respond to changing business demands

IBM Software Defined Environment capabilities span workload and infrastructure lifecycles
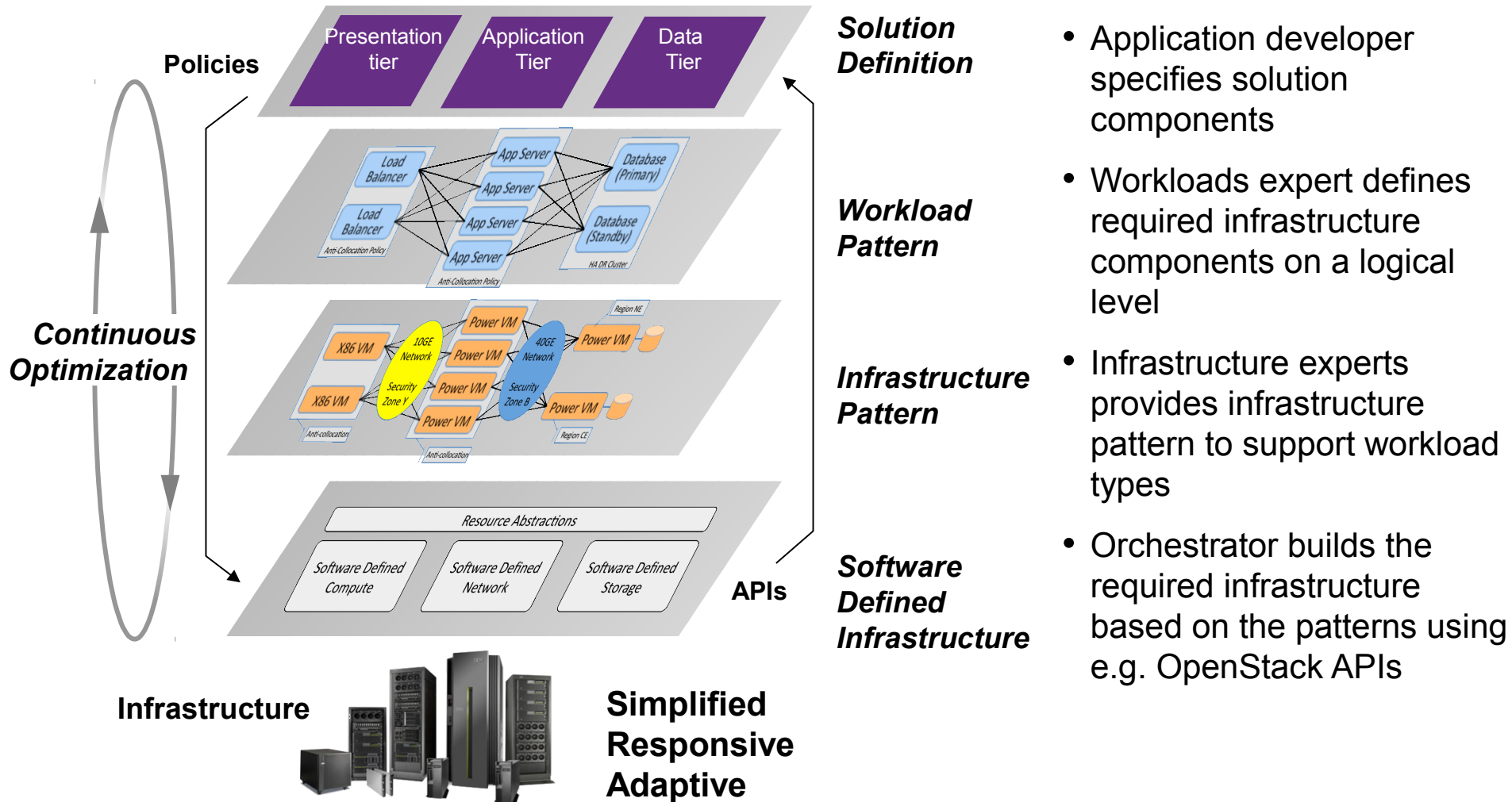
Lifecycle Management

Workload Pattern & Policy Definition	Pattern & Policy Lifecycle Management	Infrastructure Pattern & Policy Definition

Workload Abstraction

Operational Management

Performance Management	Control Plane: Workload Orchestration Resource Scheduling Analytics	Security Management
Availability Management		Problem Management

Infrastructure Management

Resource Abstraction: OpenStack

"Bare Metal" Compute Management	Virtual Compute Management	Virtual Storage Management	Virtual Networking Management

Virtual Compute Management:
- PowerVM
- zVM
- x86/KVM
- x86/ESX

Virtual Storage Management:
- Block Data
- Files
- Objects

Software Defined Environments are Workload Aware, leveraging best practices with Patterns of Expertise

Policies

Continuous Optimization

Solution Definition

Workload Pattern

Infrastructure Pattern

APIs

Software Defined Infrastructure

Infrastructure

Simplified Responsive Adaptive

- Application developer specifies solution components

- Workloads expert defines required infrastructure components on a logical level

- Infrastructure experts provides infrastructure pattern to support workload types

- Orchestrator builds the required infrastructure based on the patterns using e.g. OpenStack APIs
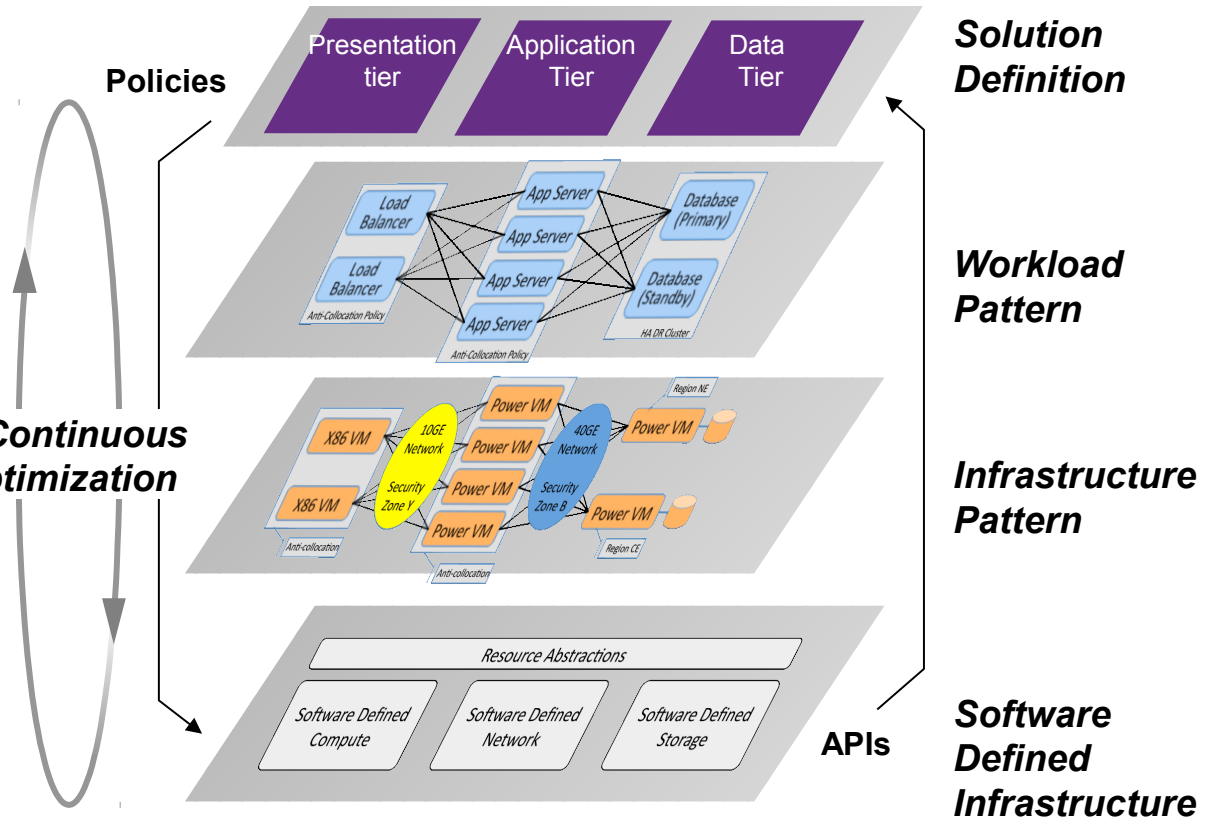
5

Software Defined Environments are automated for consistency and agility

- Programmable infrastructure via open APIs

- Workloads dynamically assigned resources based on policies

- Automated Service Activation based on policies

Policies

Continuous Optimization
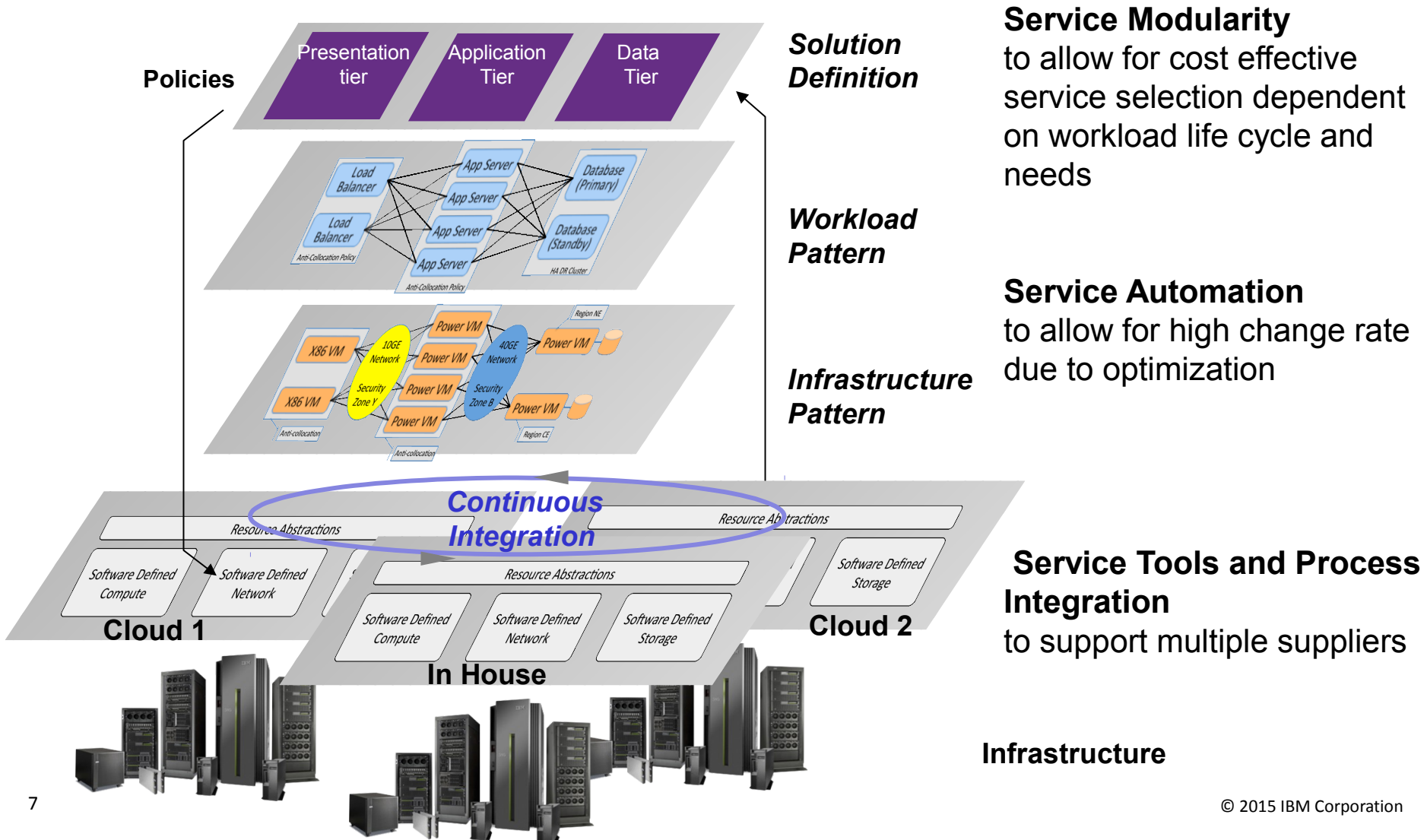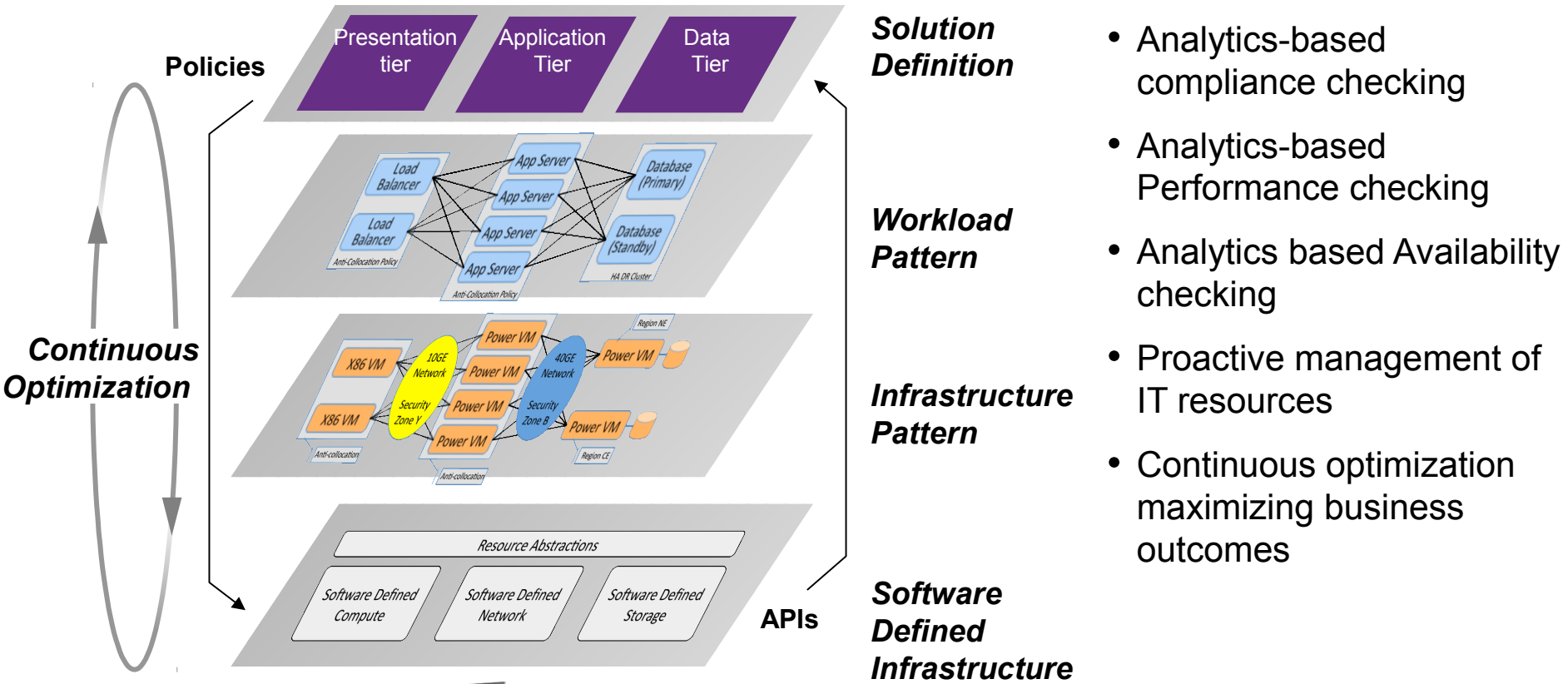
Infrastructure

Presentation tier | Application Tier | Data Tier

Solution Definition

Load Balancer — App Server — Database (Primary)
Load Balancer — App Server — Database (Standby)
App Server
App Server
Anti-Collocation Policy · HA DR Cluster

Workload Pattern

Region NE
Power VM
X86 VM · 10GE Network · Power VM · 40GE Network · Power VM
Security Zone Y · Power VM · Security Zone B
X86 VM · Power VM · Power VM
Power VM
Anti-collocation · Region CE
Anti-collocation

Infrastructure Pattern

Resource Abstractions
Software Defined Compute | Software Defined Network | Software Defined Storage

APIs

Software Defined Infrastructure

Simplified Responsive Adaptive

6

Software Defined Environments impacts Service Management

Service Modularity
to allow for cost effective service selection dependent on workload life cycle and needs

Service Automation
to allow for high change rate due to optimization

Service Tools and Process Integration
to support multiple suppliers

Infrastructure

Software Defined Environments are Workload Aware, leveraging Analytics for Continuous Optimization

- Analytics-based compliance checking

- Analytics-based Performance checking

- Analytics based Availability checking

- Proactive management of IT resources

- Continuous optimization maximizing business outcomes

Is your IT already an SDE?

Software defined environment (SDE)