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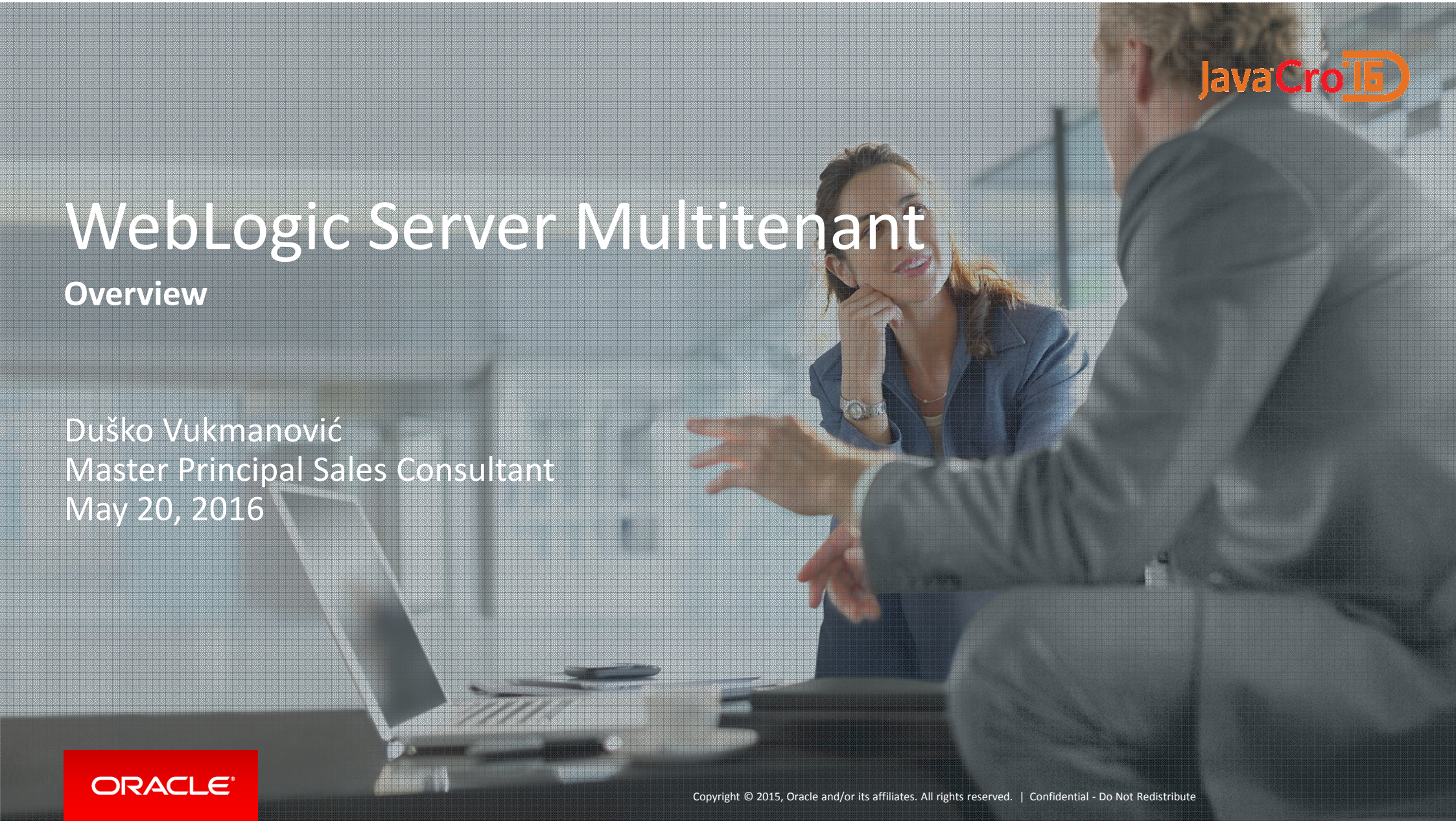

WebLogic Server Multitenant

Overview

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Safe Harbor Statement

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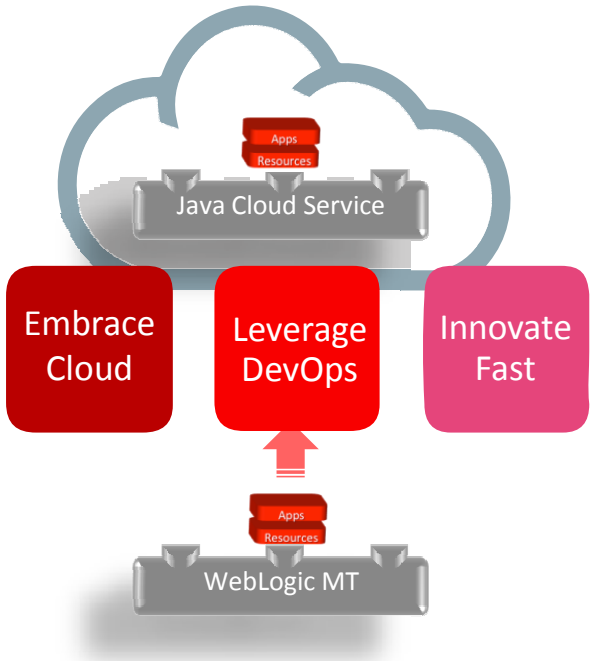
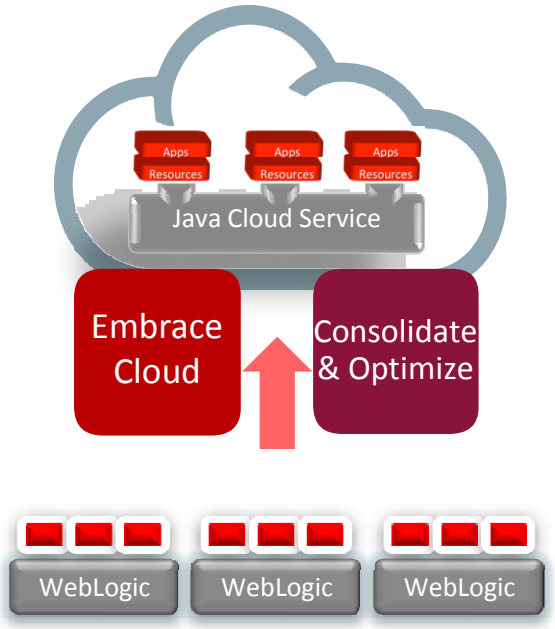
WebLogic Multitenant: Solving Critical Business Challenges

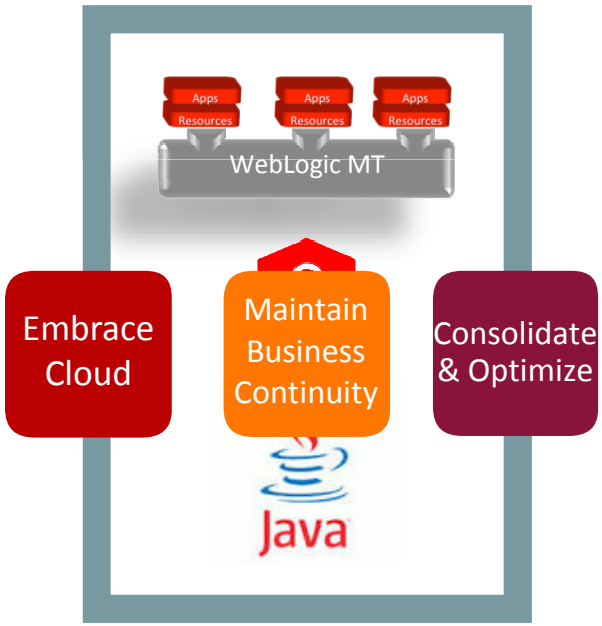
Microcontainer
Portability for Devops



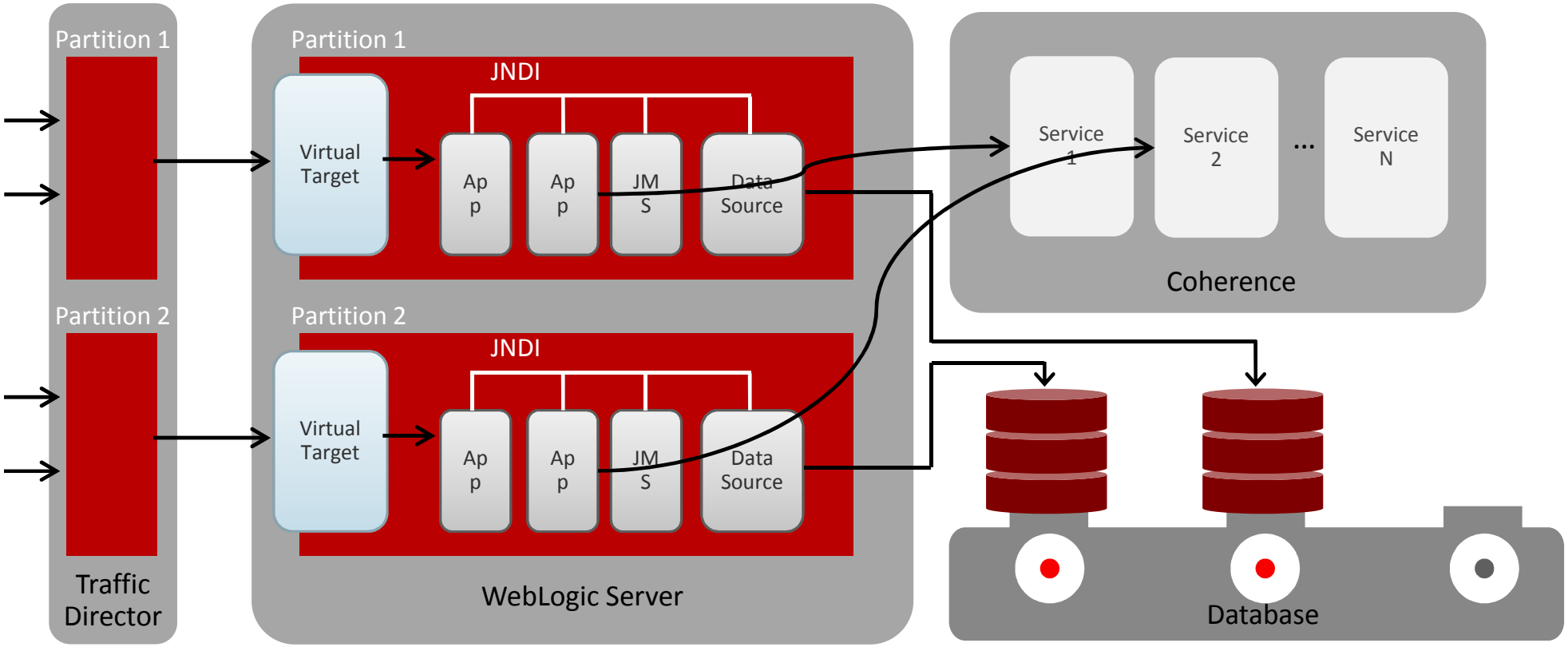
3X Consolidation Ratio



Secure/Isolated
Multitenant Java

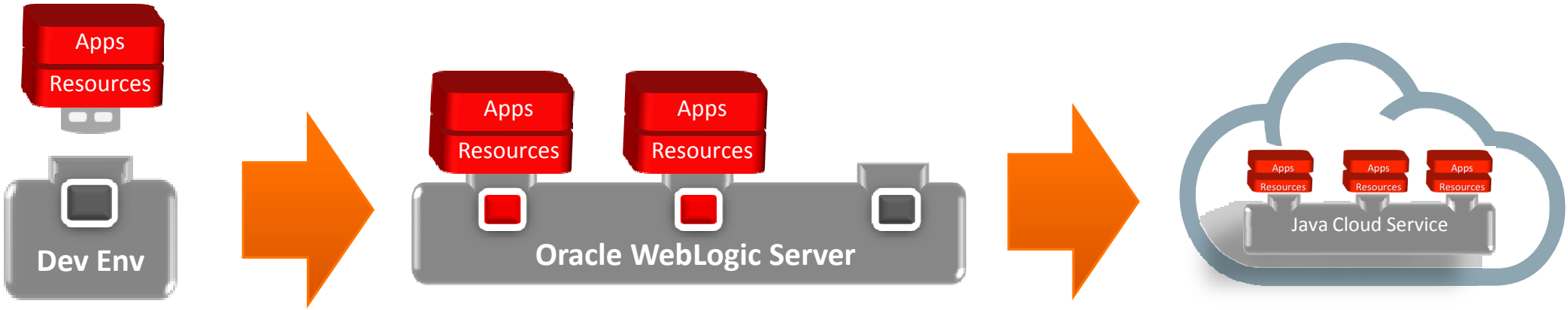


Key Technical Concepts



Microcontainers in WebLogic Server 12.2.1

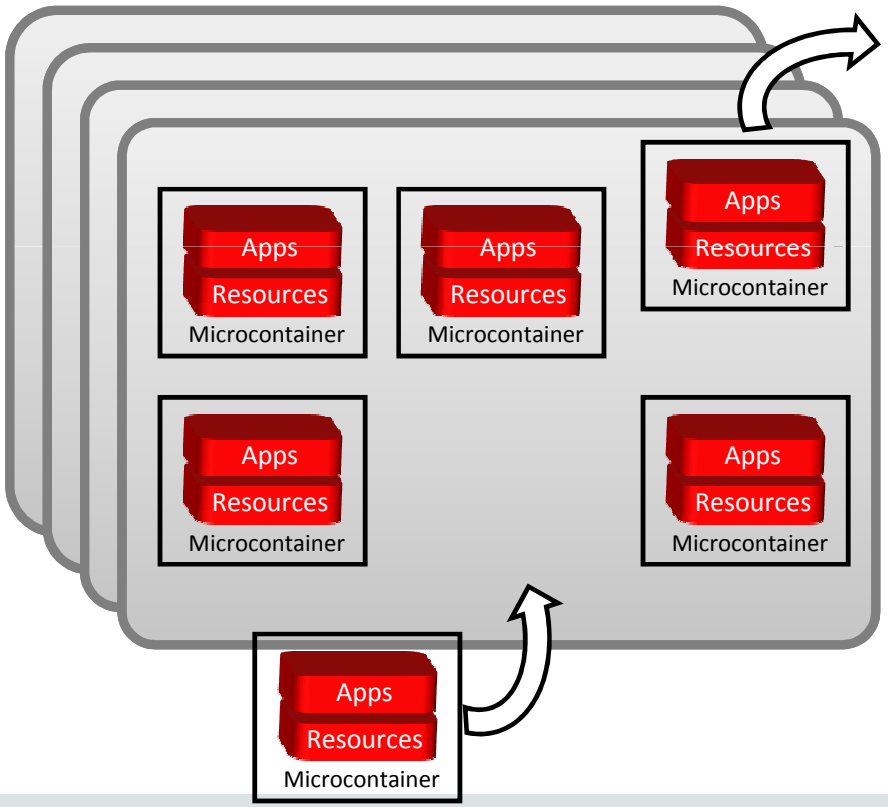
- Maximum **portability** between environments
- **Parity** between dev and production
- **Fast** startup/shutdown – disposability
- Easy **scale up**
- Enable migration to the **cloud**



High Density/Virtualization

3X Density Improvement

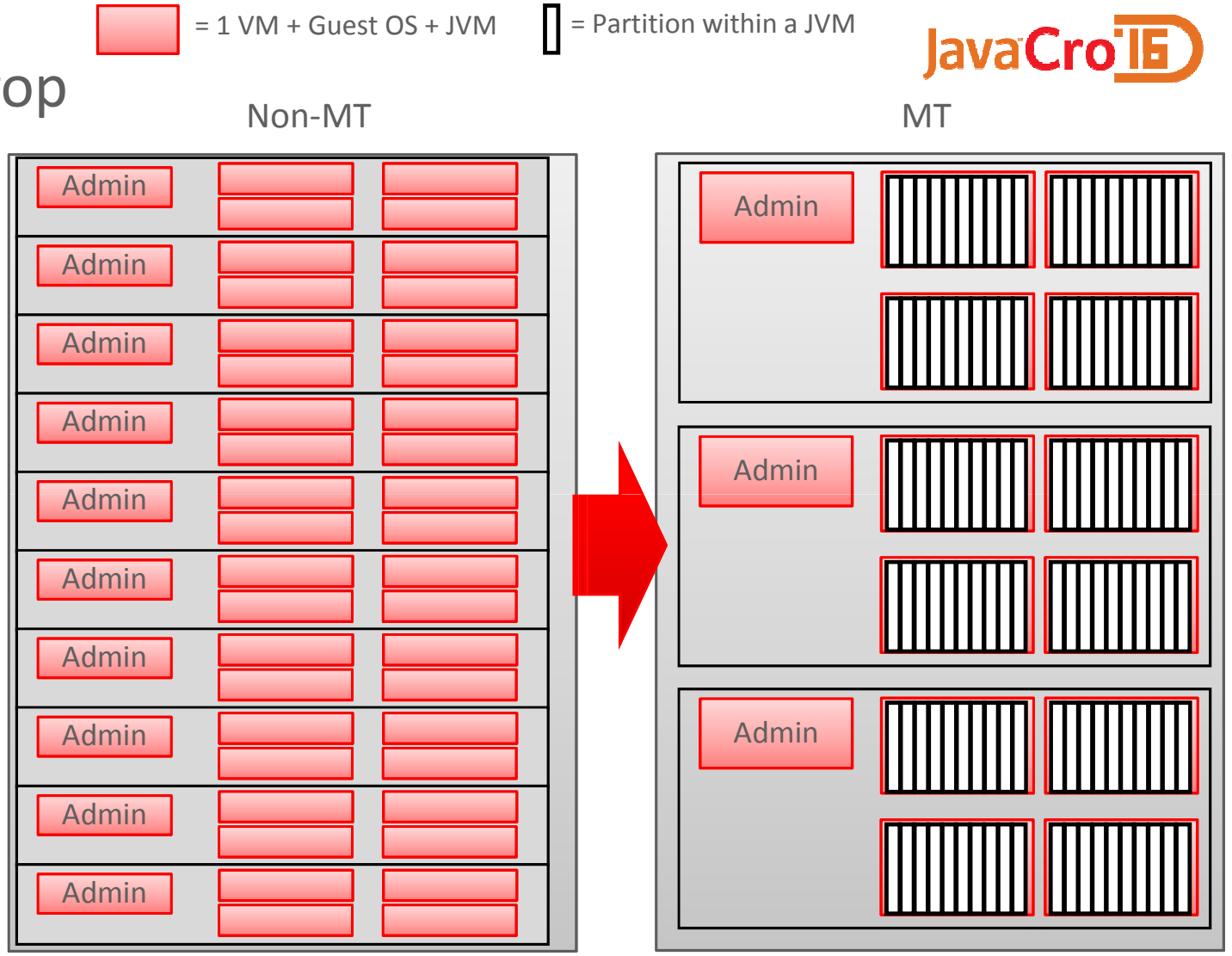
- **Lower Total Cost of Ownership of server-side Java Infrastructure**
  - Reduce hardware footprint/CAPEX by 66%
  - Reduce OPEX costs by 25%
  - Consolidate domains by 10X
- **Simplify with Java Cloud Infrastructure**
  - Easy to adopt
  - Elasticity on demand
  - Promotes consistency, quality, and standardization



WebLogic MT Value Prop

Density

- Benchmark Data shows significant consolidation opportunities
- Running 10 partitions in shared JVMs shows no increase in response times, minimal increase in memory footprint
- CPU load per app is reduced



MT Benchmark Data

MedRec		Non-MT: 1 domain Admin + 4 node cluster 1 app/domain	Non-MT: Extrapolated for 10 domains	WLS-MT: 1 domain Admin + 4-node cluster 10 partitions/domain 1 app/partition	Savings
JVM Heap Setting		-Xms:512m –Xmx 2g	-Xms:512m –Xmx 2g	-Xms:512m –Xmx 2g	
Concurrent users		400	4000	4000	
TPS	Transaction/Sec	2.37	23.7	23.45	
Response Time (Sec)	90% RT	0.47	0.239	0.057	
	Average RT	0.17	0.107	0.052	
CPU Usage	%CPU (per VM)	2% each on 4 CPUs 0.5% of total server CPU capacity	5% each on 16 CPUs 5% of total server CPU capacity	8% of 4 CPUs 2% of total server CPU capacity	**60%/2.5X less CPU usage**
Process OS Memory Footprint (GB)	Average	3.88 (0.97 each on 4 VMs)	38.8 (0.97 each on 40 VMs)	11.2 (2.8 each on 4 VMs)	**71%/3.5X less memory usage**

Isolation for Pluggable Partitions

Independence and Autonomy for Microcontainers

Runtime Isolation

- JDK and WebLogic partnership
- Heap, CPU, threads, requests…

Administrative Isolation

- Admin roles, lifecycle, troubleshooting

Security/Identity Isolation

- Realm, users per partition

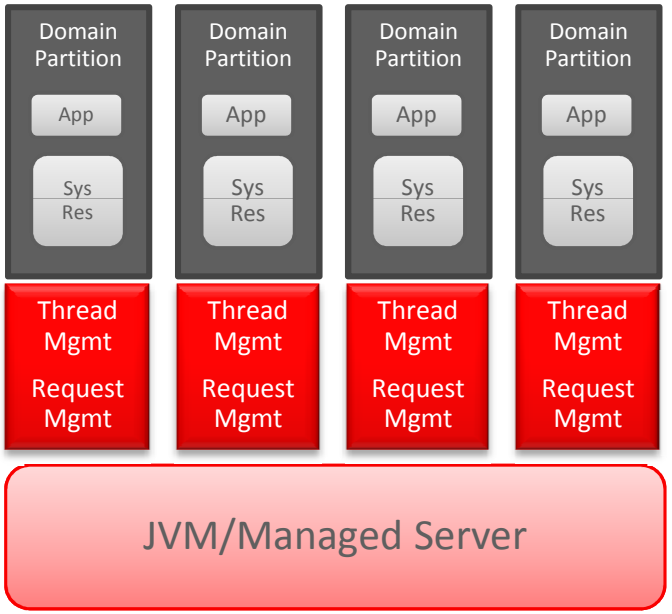
Traffic/Data Isolation

- Dedicated JNDI, segregated data
- Dedicated and shared Coherence caches

Partition Work Managers

Request and Thread Management in WebLogic Server

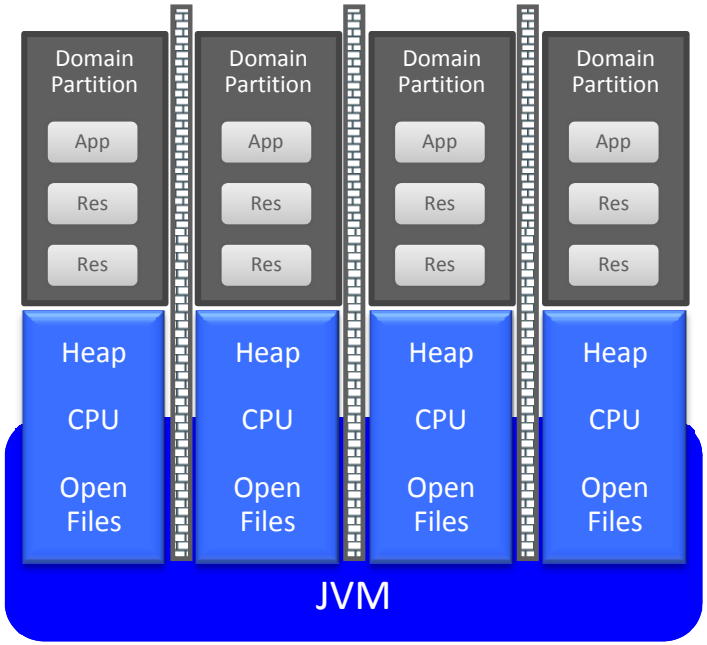
- max threads constraint
  - limits on the number of threads that will be concurrently allocated to a partition
- min threads constraint cap
  - Sets a cap on the number of thread to satisfy minimum thread constraints within the partition
- Fair Share
  - Ratio of request processing
- Shared Capacity percent
  - Defines a percentage of the global request limit (default global request limit is 65536)
  - Can be used to prevent DoS



Resource Consumption Managers

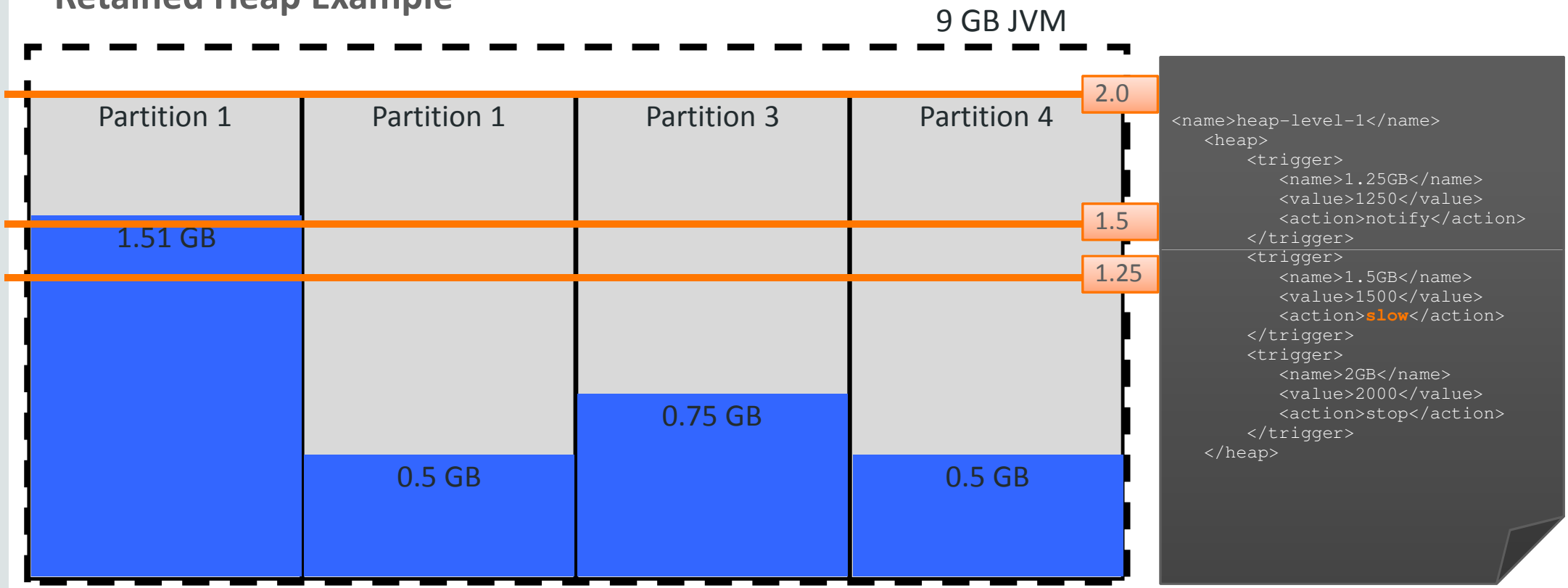
Runtime Isolation Within a JVM

- Deep integration between WebLogic Server and the Oracle JDK
- Prevents resource hogging, protects applications in a shared JVM
- Managed resources
  - **Retained heap, CPU time, open file descriptors**
- Triggerable actions
  - **Notify –** inform administrator that a threshold has been crossed
  - **Slow –** reduce partition's ability to consume resources
  - **Fail –** reject requests for the resource (file descriptors only)
  - **Stop –** initiate the shut down sequence for the offending partition
- "Boundaries" and Fair Share usage patterns



Resource Manager Policy

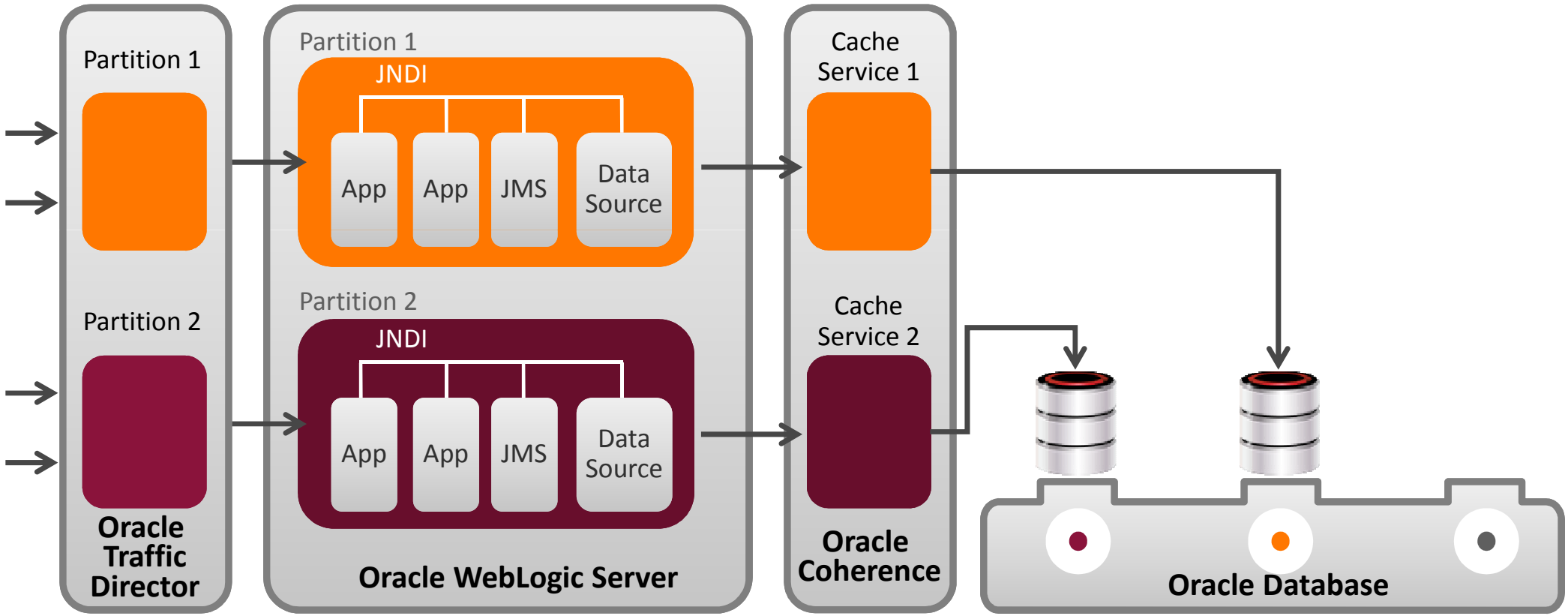
Retained Heap Example



Security Isolation for Domain Partitions

- Per partition configuration
  - Per-partition security realm (includes configuration for authentication, authorization, credential mapping, auditing, password validation, certificate validation, and user lockout)
- Roles scoped to partitions
  - Admin, operator, deployer, monitor
- Identity Domain
  - Logical namespace for users and groups
  - Each partition has a primary identity domain – defines set of users
  - Default polices allow users in that IDD to access the partition, but not users in other IDDs
  - Multiple partitions can use the same IDD – polices and roles are shared, identical access OOTB

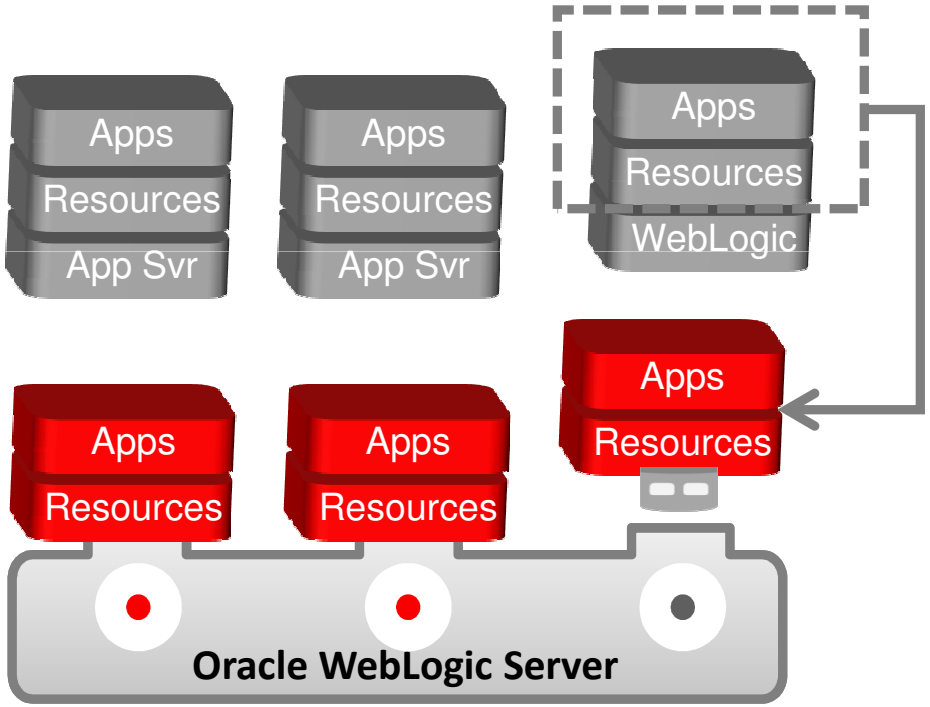
End-to-End Integration



Multitenancy in WebLogic 12.2.1

Summary

- Agility/devops with lightweight **pluggable partitions**
  - Ultra-light container-like service packaging
- **High density** with domain and JVM sharing
  - Consolidate/virtualize within domains and JVMs
- **Isolation** between microcontainers
  - Runtime, administration, security, data



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