Software- und Organisations-Service

Consulting Services

Consulting Services

JobScheduler
Architecture Decision Template

Information for Consulting Parties

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Consulting Services

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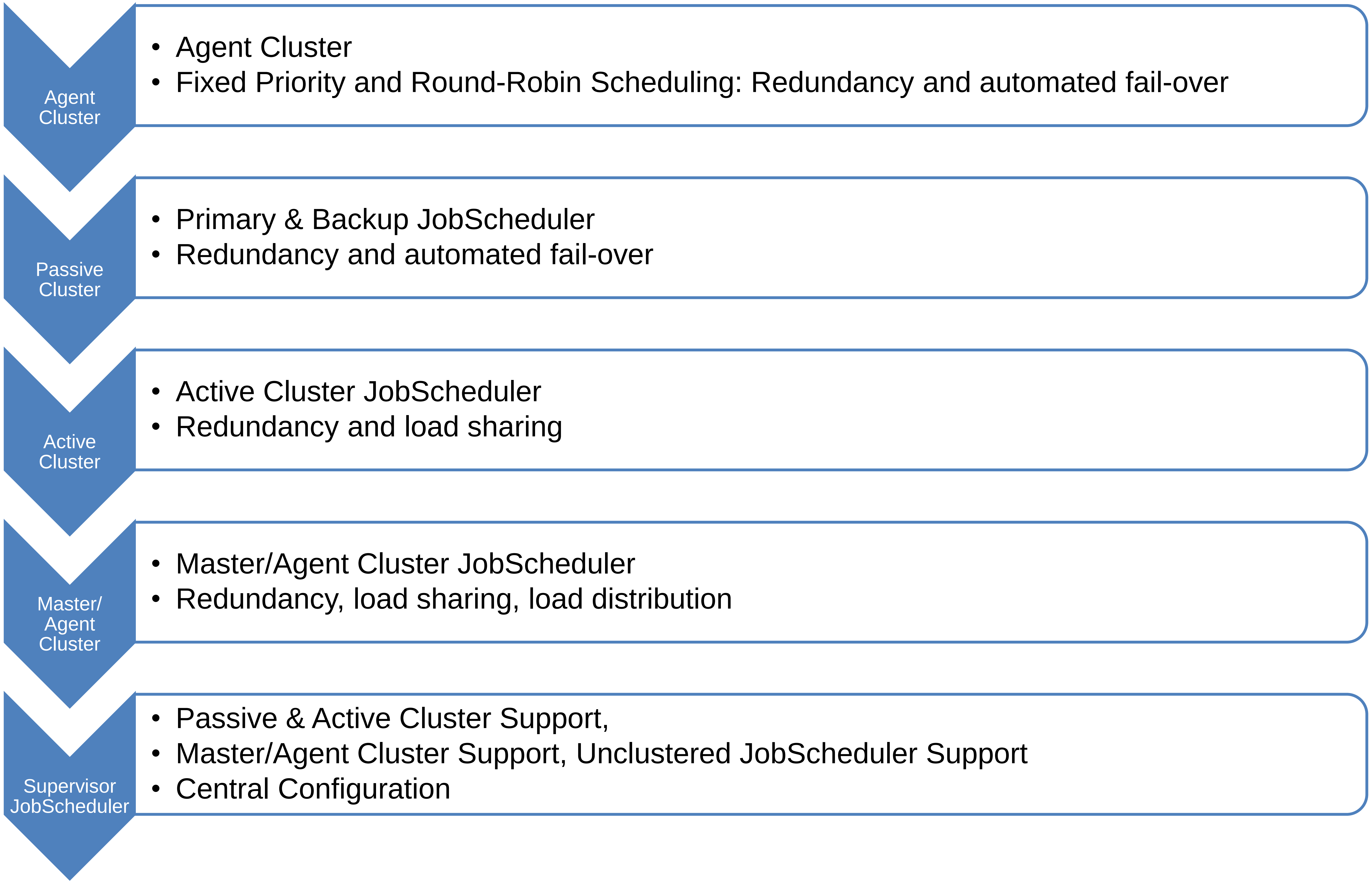
Architecture Decisions

Architecture Decision Template



Agent Cluster

- Agent Cluster
- Fixed Priority and Round-Robin Scheduling: Redundancy and automated fail-over

Passive Cluster

- Primary & Backup JobScheduler
- Redundancy and automated fail-over

Active Cluster

- Active Cluster JobScheduler
- Redundancy and load sharing

Master/ Agent Cluster

- Master/Agent Cluster JobScheduler
- Redundancy, load sharing, load distribution

Supervisor JobScheduler

- Passive & Active Cluster Support,
- Master/Agent Cluster Support, Unclustered JobScheduler Support
- Central Configuration

Components: JOC Cockpit / Web Service / Master / Agent

Overview: Components

JOC Cockpit / Web Service

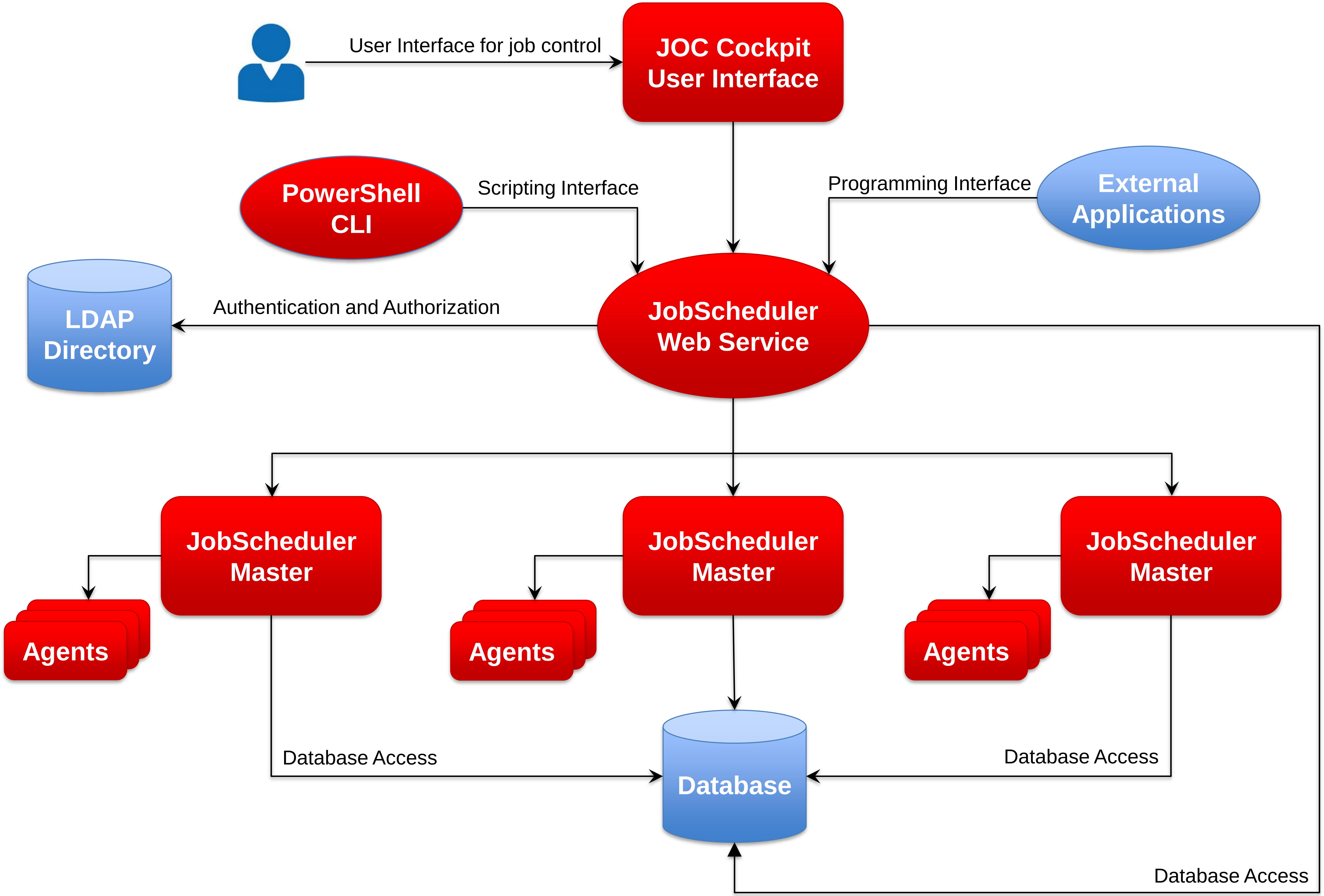
- The JOC Cockpit is the user interface for job control with browsers
- Users access the Master using a Web Service that performs authentication and authorization – optionally against an LDAP directory

Interfaces

- The PowerShell Command Line Interface and External Applications use the same Web Service for access to a JobScheduler Master
- Authorization is available for individual requests to the JobScheduler Master

Master / Agent

- The JobScheduler Master executes tasks and orchestrates Agents
- Agents are deployed on top of existing servers running the programs and scripts that should be scheduled



Security: JOC Cockpit / Web Service / Master / Agent

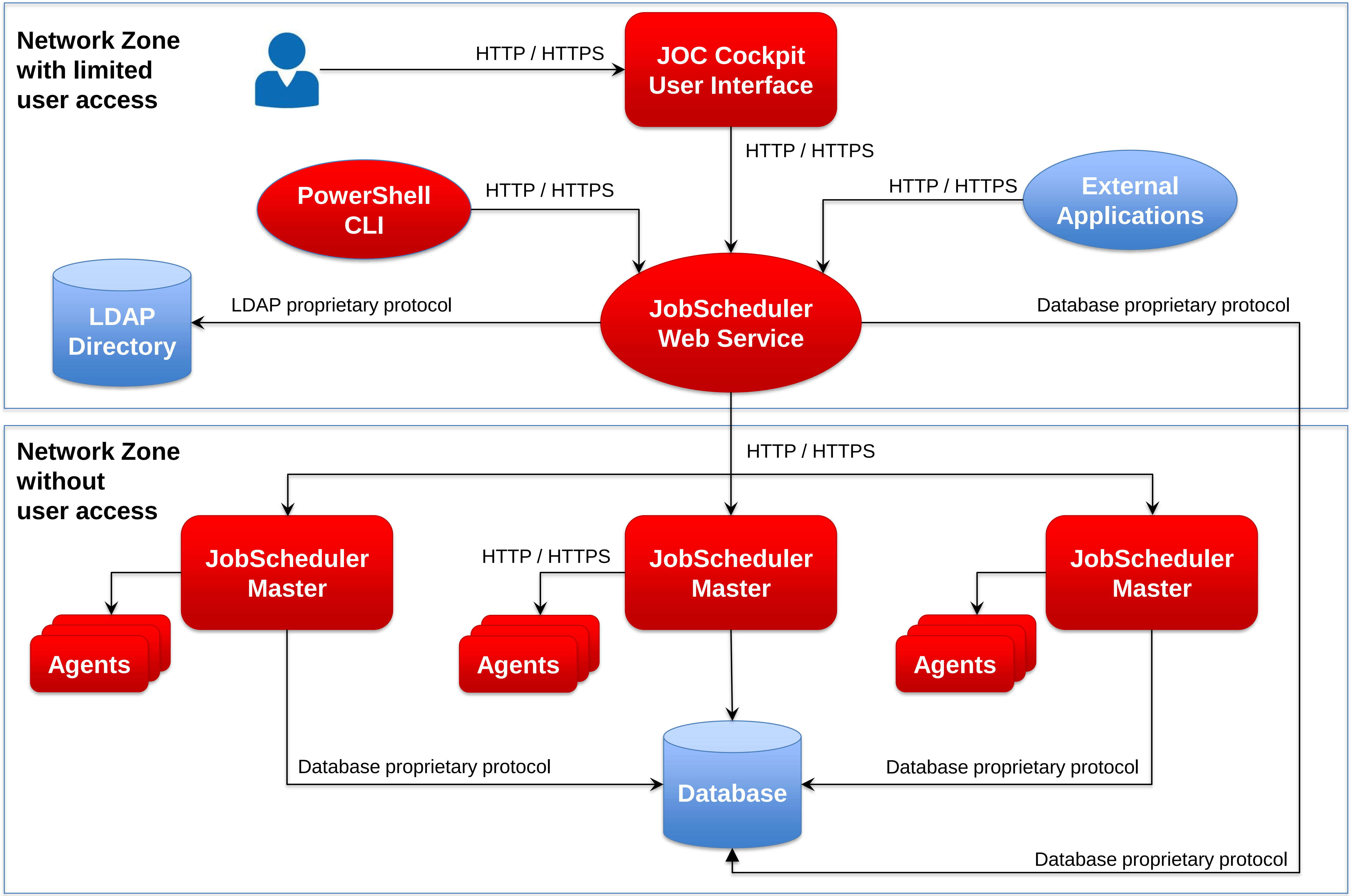
Overview: Security

Network Zone with restricted user access

- Users have limited access that requires authentication
- Any connection to a Master is authenticated by the Web Service that can be configured to use LDAP
- Use of HTTPS for connections can be enforced

Network Zone without user access

- Master and Agent instances are operated in this zone without direct user access
- The Master instances are accessed exclusively by the Web Service
- The Agent instances are accessed exclusively by Master instances


Network Zone with limited user access
HTTP / HTTPS
JOC Cockpit User Interface
HTTP / HTTPS
PowerShell CLI
HTTP / HTTPS
HTTP / HTTPS
External Applications
LDAP Directory
LDAP proprietary protocol
JobScheduler Web Service
Database proprietary protocol
Network Zone without user access
HTTP / HTTPS
JobScheduler Master
HTTP / HTTPS
JobScheduler Master
JobScheduler Master
Agents
Agents
Agents
Database proprietary protocol
Database
Database proprietary protocol
Database proprietary protocol

Platforms: JOC Cockpit / Web Service / Master / Agent

Overview: Supported Platforms

Cockpit / Web Service

- The JOC Cockpit and REST Web Service are available for Windows and Linux

Master / Agent

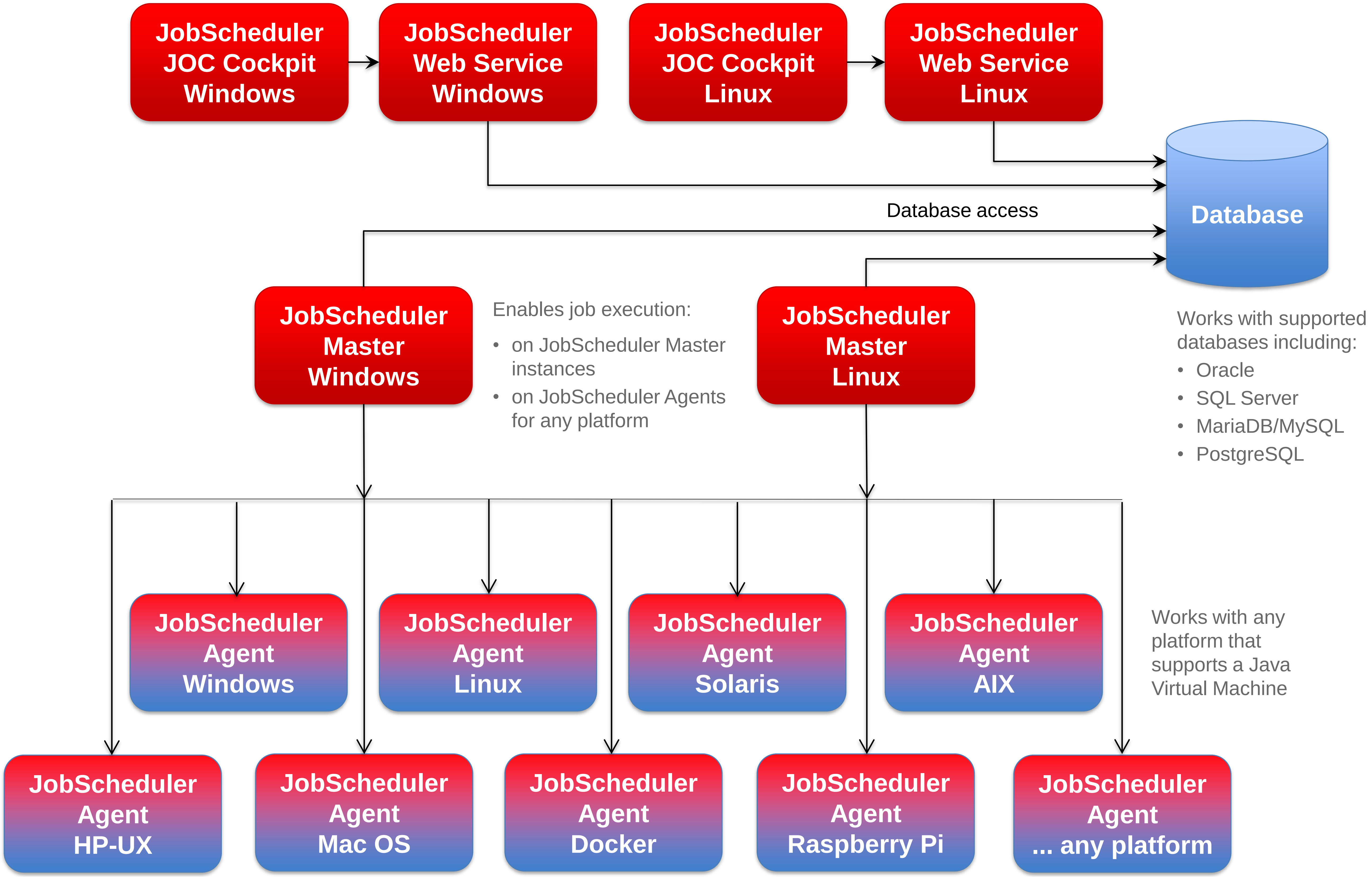
- JobScheduler Master is available for Windows and Linux
- JobScheduler Agents are available for any platform that supports a Java Virtual Machine

Database

- The JobScheduler REST Web Service and Master use a database on any platform

Jobs

- Jobs can be executed locally on the Master
- Jobs can be executed on any JobScheduler Agent



JobScheduler JOC Cockpit Windows

JobScheduler Web Service Windows

JobScheduler JOC Cockpit Linux

JobScheduler Web Service Linux

Database

Database access

JobScheduler Master Windows

Enables job execution:

- on JobScheduler Master instances
- on JobScheduler Agents for any platform

JobScheduler Master Linux

Works with supported databases including:

- Oracle
- SQL Server
- MariaDB/MySQL
- PostgreSQL

JobScheduler Agent Windows

JobScheduler Agent Linux

JobScheduler Agent Solaris

JobScheduler Agent AIX

Works with any platform that supports a Java Virtual Machine

JobScheduler Agent HP-UX

JobScheduler Agent Mac OS

JobScheduler Agent Docker

JobScheduler Agent Raspberry Pi

JobScheduler Agent ... any platform

Setup Scenario: Standalone JobScheduler Server

Scenario: Standalone JobScheduler Server for Interface, Master and Database

JOC Cockpit / Web Service

- The JOC Cockpit is the user interface for job control
- Users access the Master using a Web Service that performs authentication and authorization

Master

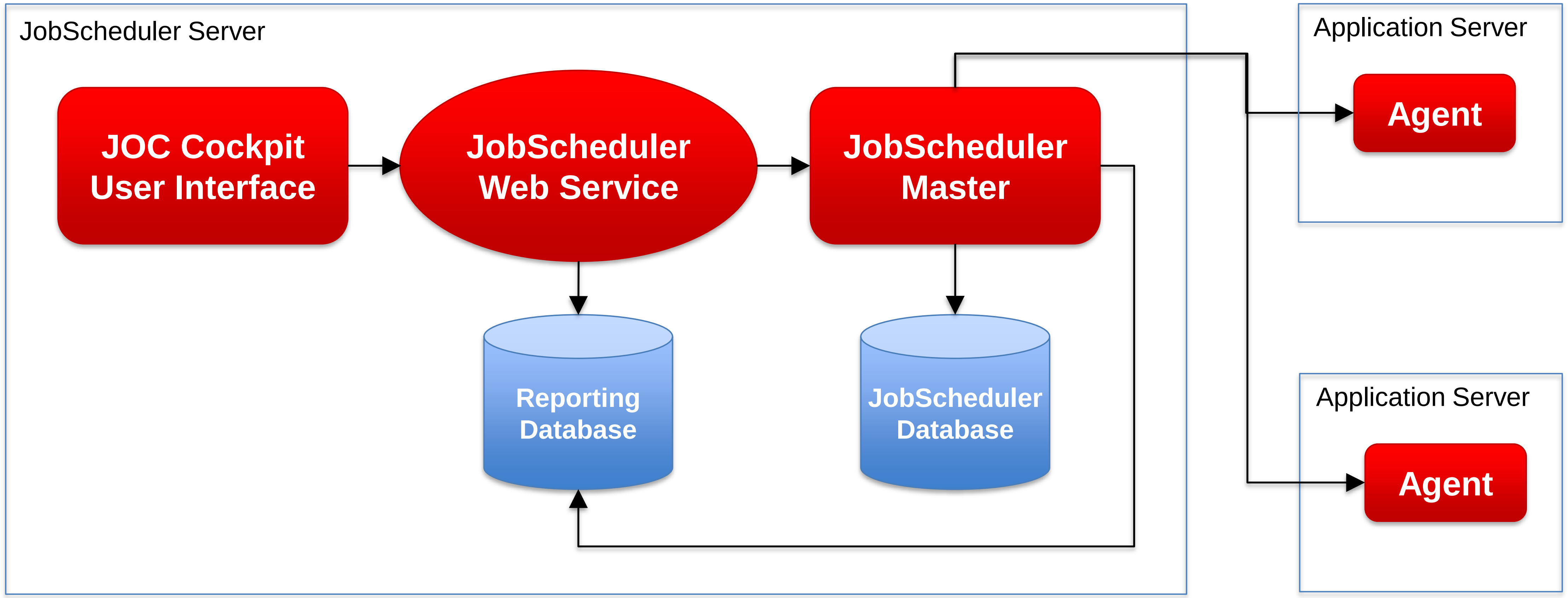
- The JobScheduler Master executes local tasks and orchestrates Agents for execution of remote tasks

Database

- The JobScheduler Database stores run-time information
- The Reporting Database stores the inventory and history information of jobs
- Databases can be mapped to a single database with a common schema

Agent

- Agents are deployed on top of existing servers running the programs and scripts that should be scheduled



Setup Scenario: JobScheduler Server, Database Server

Scenario: Standalone JobScheduler Server for Interface and Master, separate Database Server

JOC Cockpit / Web Service

- The JOC Cockpit is the user interface for job control
- Users access the Master using a Web Service

Master

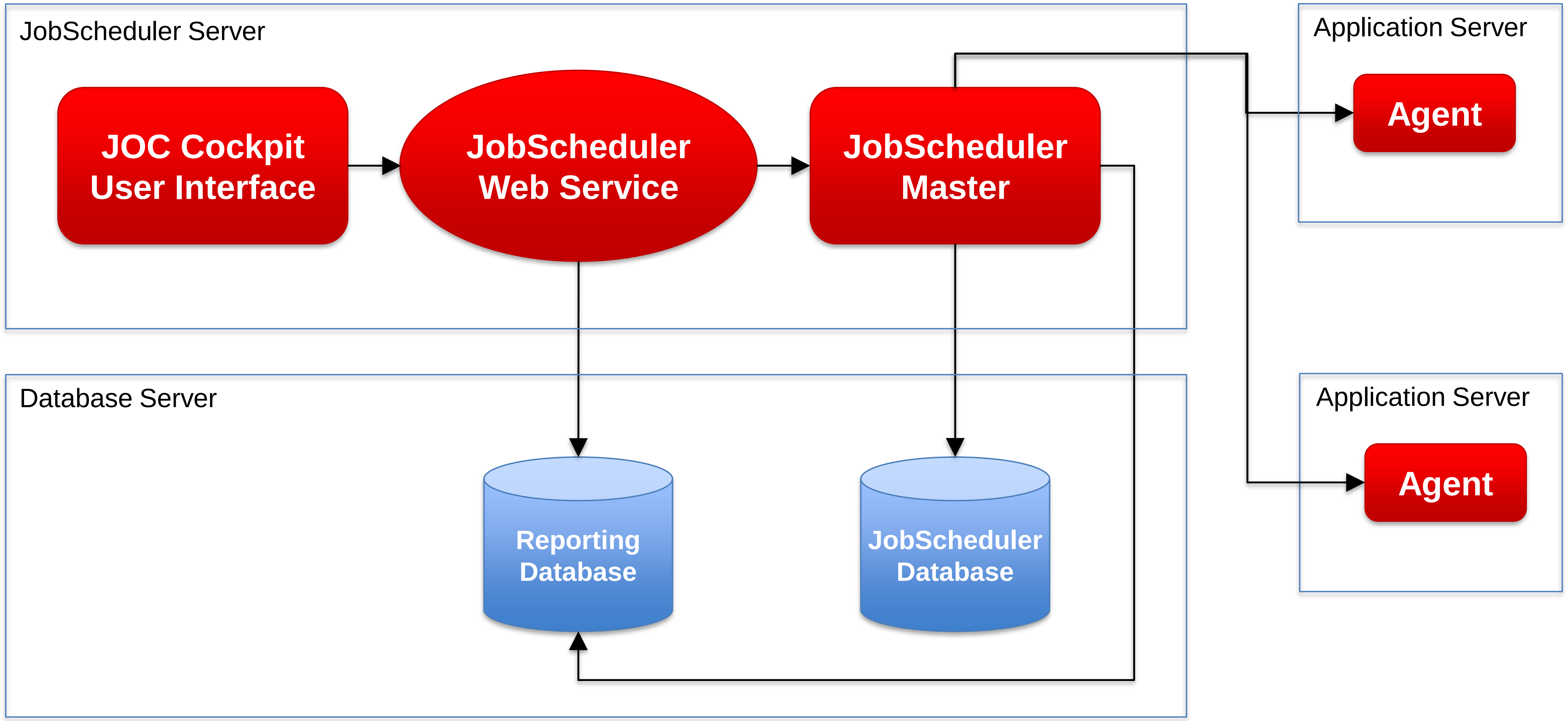
- The JobScheduler Master executes local tasks and orchestrates Agents for execution of remote tasks

Database

- The JobScheduler Database stores run-time information
- The Reporting Database stores the inventory and history information of jobs
- Databases can be operated from a database server and can be mapped to a single database instance with a common schema

Agent

- Agents are deployed on top of existing servers running the programs and scripts that should be scheduled



Setup Scenario: High Availability

Scenario: Standalone Interface Server, Master Cluster, Database Server

JOC Cockpit / Web Service

- The JOC Cockpit is the user interface for job control
- Users access the Master using a Web Service

Master Cluster

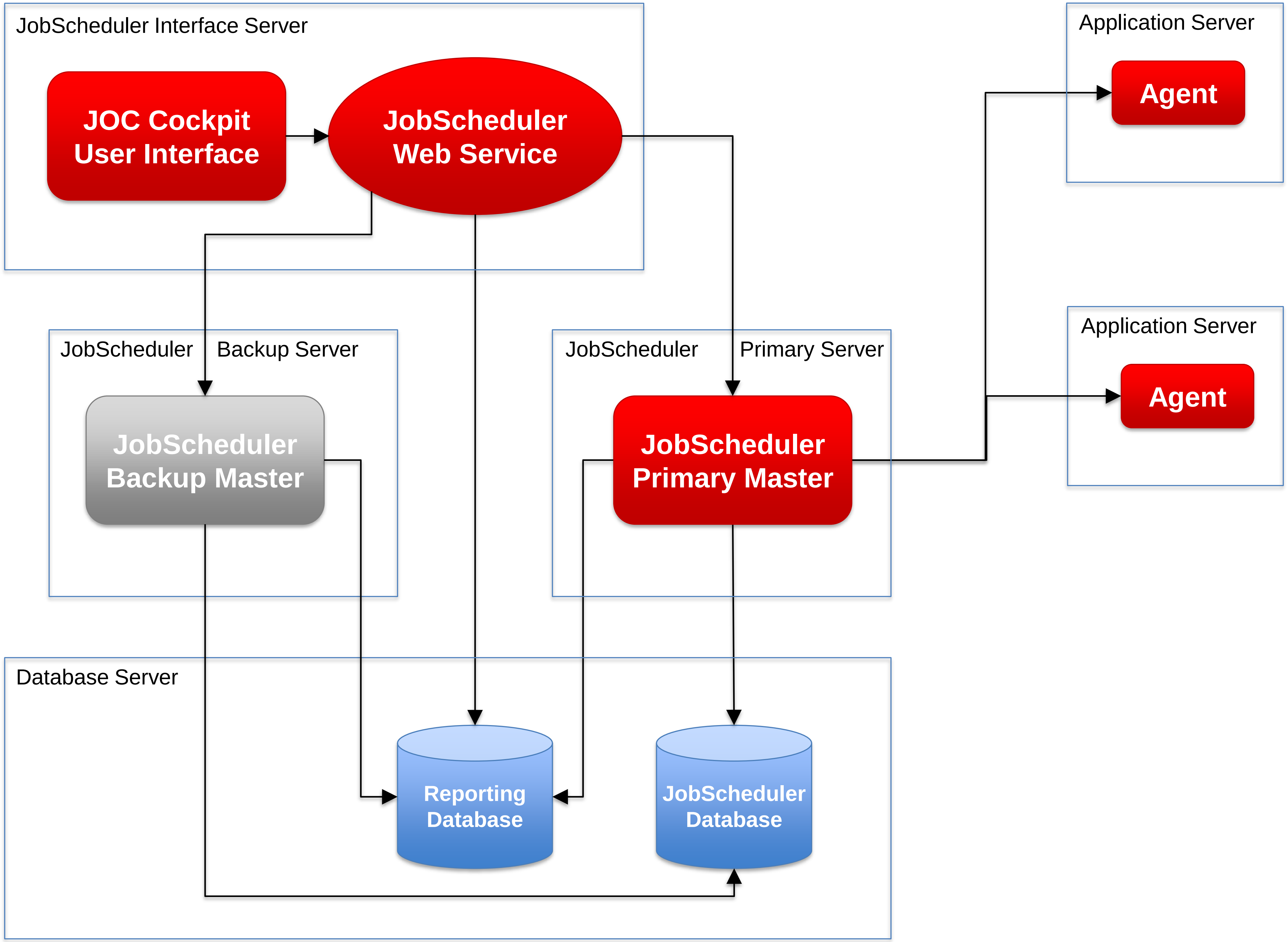
- Primary and Backup Master implement an automated failover in case of failure
- Primary and Backup Master are accessed by the Web Service
- Primary and Backup Master use a clustered database

Database

- JobScheduler and Reporting Databases are available in a database cluster

Agent

- Agents are deployed on top of existing servers and can be accessed by the Primary and Backup Master


JobScheduler Interface Server
JOC Cockpit User Interface
JobScheduler Web Service
Application Server
Agent
Application Server
Agent
JobScheduler Backup Server
JobScheduler Backup Master
JobScheduler Primary Server
JobScheduler Primary Master
Database Server
Reporting Database
JobScheduler Database

Setup Scenario: High Availability

Scenario: Master Passive Cluster, JOC Cockpit Active Cluster, Database Server

JOC Cockpit / Web Service

- The JOC Cockpit is the user interface for job control
- A number of JOC Cockpit instances are operated as an active cluster
- Each JOC Cockpit instance can access any Master

Master Cluster

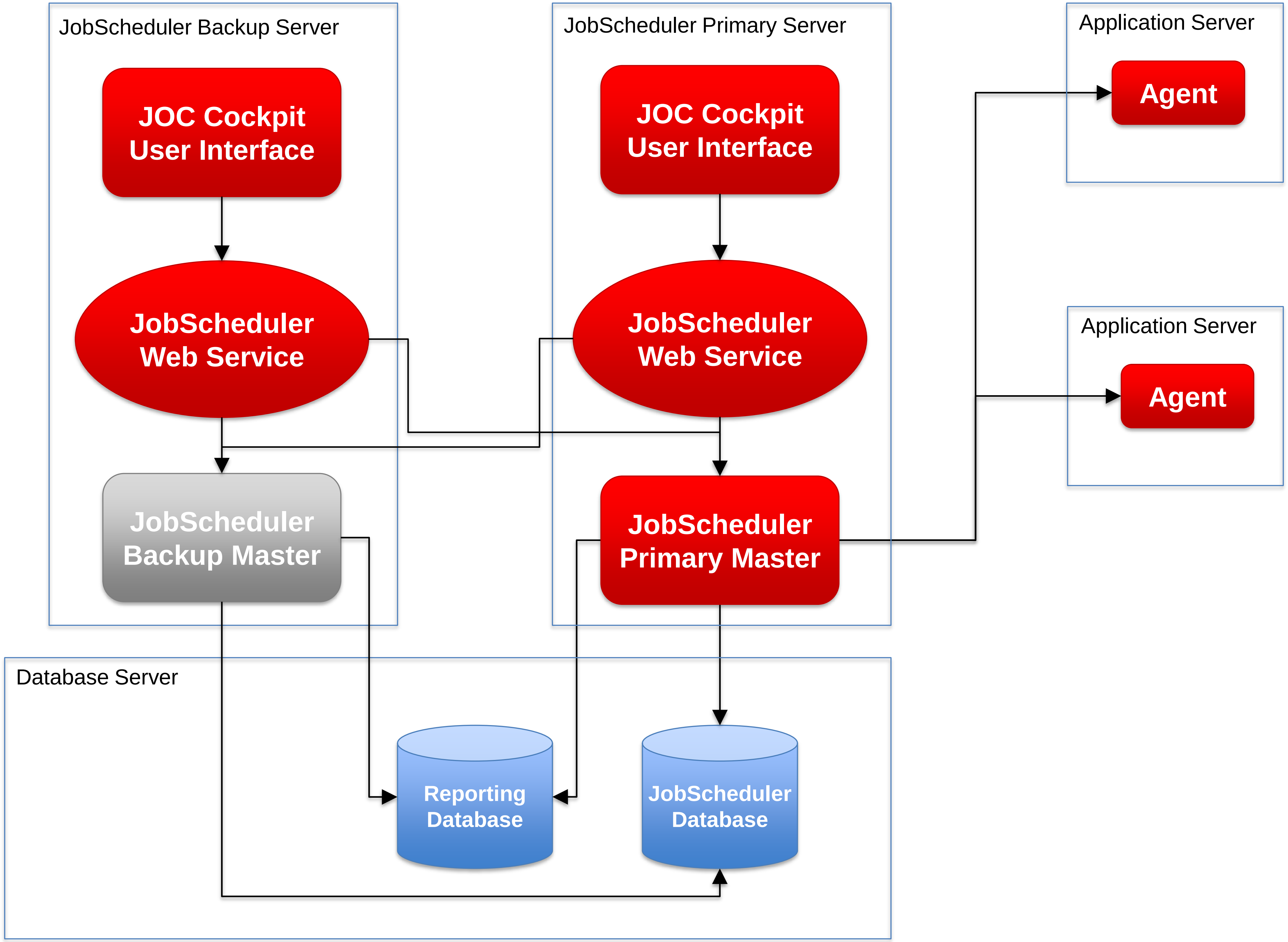
- Primary and Backup Master implement an automated failover in case of failure
- Primary and Backup Master use a clustered database

Database

- JobScheduler and Reporting Databases are available in a database cluster

Agent

- Agents are deployed on top of existing servers and can be accessed by the Primary and Backup Master


JobScheduler Backup Server
JOC Cockpit User Interface
JobScheduler Web Service
JobScheduler Backup Master
JobScheduler Primary Server
JOC Cockpit User Interface
JobScheduler Web Service
JobScheduler Primary Master
Application Server
Agent
Application Server
Agent
Database Server
Reporting Database
JobScheduler Database

Setup Scenario: Multi Master

Scenario: Interface Server, Multi Master Servers with local Databases, Reporting Database Server

JOC Cockpit / Web Service

- The JOC Cockpit is the user interface for job control
- Users access the Master using a Web Service

Master

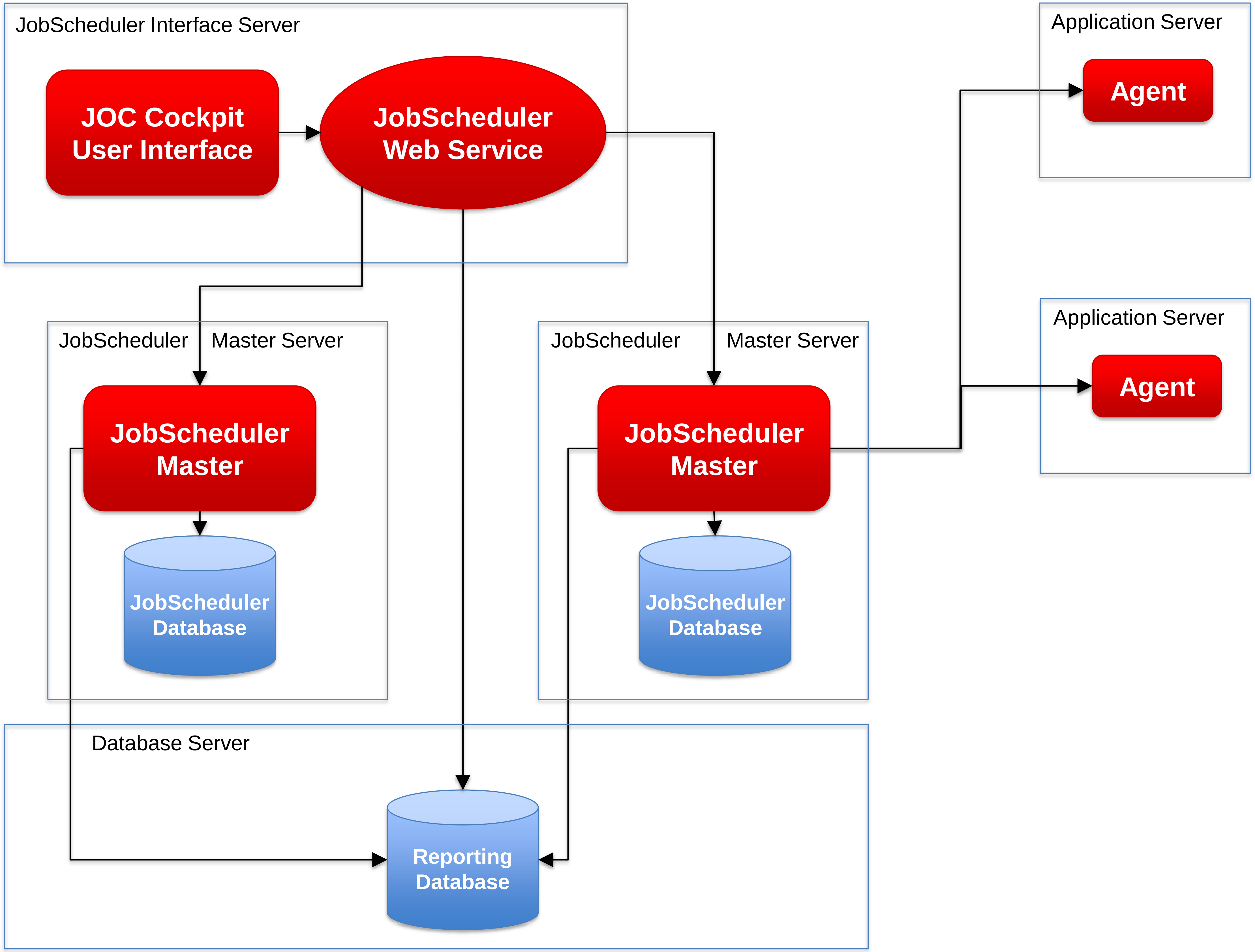
- Multiple Master instances are accessed by the JOC Cockpit user interface

Database

- The JobScheduler Database stores run-time information and is operated locally per each Master instance
- The Reporting Database stores the inventory and history information of jobs
- Failure of the Reporting Database does not prevent a Master from running jobs

Agent

- Agents are deployed on top of existing servers and can be accessed by any Master



Architecture: JobScheduler Agent Cluster

Architecture Decision Templates: Agent Cluster

Master/Agent Platforms

- JobScheduler Master is available for Windows and Linux
- JobScheduler Agents are available for any platform that supports a Java Virtual Machine

Agent Cluster

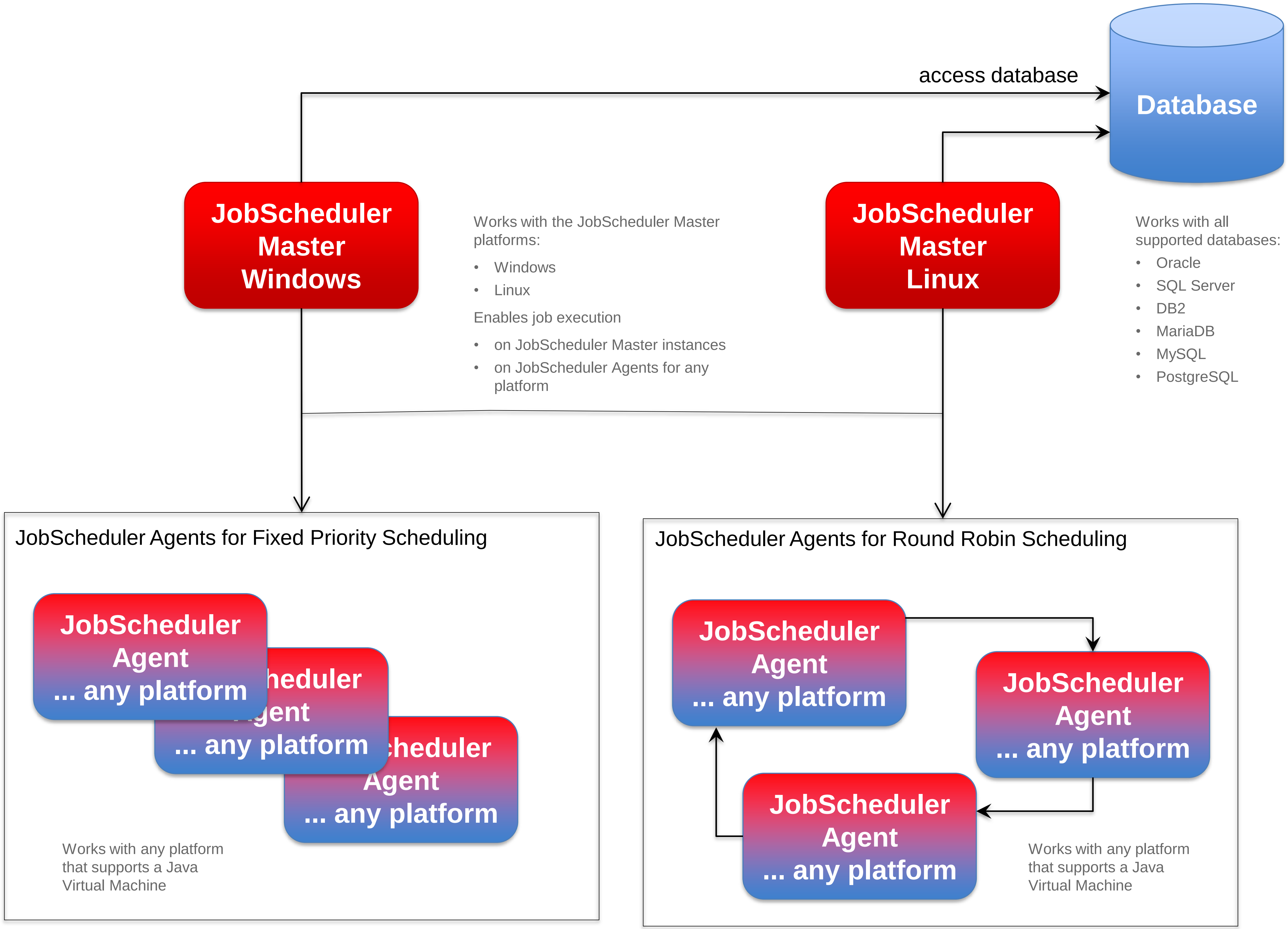
- Agents can be configured to work in a Cluster.

Fixed Priority Scheduling

- JobScheduler Master selects the first available Agent from a Cluster for job execution.
- Should an Agent not be available then the next available Agent is used.

Round-Robin Scheduling

- JobScheduler Master switches the Agent used for each job execution.
- Should an Agent not be avialable the the next available Agent is used.



access database
Database
JobScheduler Master Windows
JobScheduler Master Linux
JobScheduler Agents for Fixed Priority Scheduling
JobScheduler Agent ... any platform
heduler gent ... any platform
heduler Agent ... any platform
JobScheduler Agents for Round Robin Scheduling
JobScheduler Agent ... any platform
JobScheduler Agent ... any platform
JobScheduler Agent ... any platform

Works with the JobScheduler Master platforms:

- Windows
- Linux

Enables job execution

- on JobScheduler Master instances
- on JobScheduler Agents for any platform

Works with all supported databases:

- Oracle
- SQL Server
- DB2
- MariaDB
- MySQL
- PostgreSQL

Works with any platform that supports a Java Virtual Machine

Works with any platform that supports a Java Virtual Machine

Architecture: Primary JobScheduler Master

Architecture Decision Templates: Master Passive Cluster

Passive Cluster

- Primary and Backup JobScheduler Master use the same database
- Primary JobScheduler Master is monitored by its failover instance
- Failover instance operates in stand-by mode
- All connections to servers use the SSH protocol

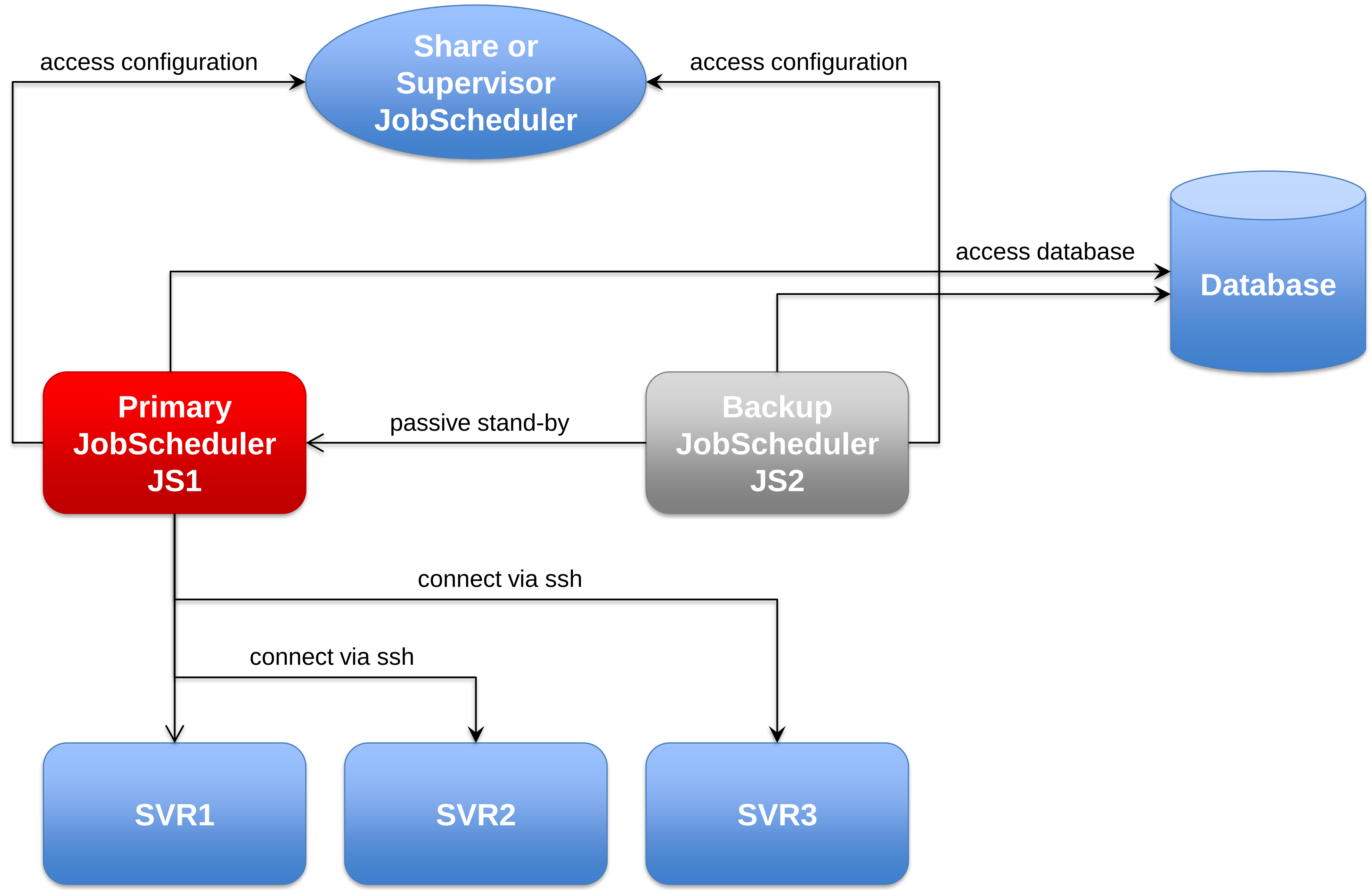
SSH Connections

JITL Jobs

- Requires a JVM per task
- Memory resources

SSH Client

- No pre-/post-processing
- No substitution of parameters in script files
- Script files have to be provided on the target system



Architecture: Backup JobScheduler Master

Architecture Decision Templates: Master Passive Cluster

Passive Cluster

- Primary and Backup JobScheduler Master both use the same database
- Backup JobScheduler Master is active after failure of Primary instance
- Primary instance operates in stand-by mode
- All connections to servers use the SSH protocol

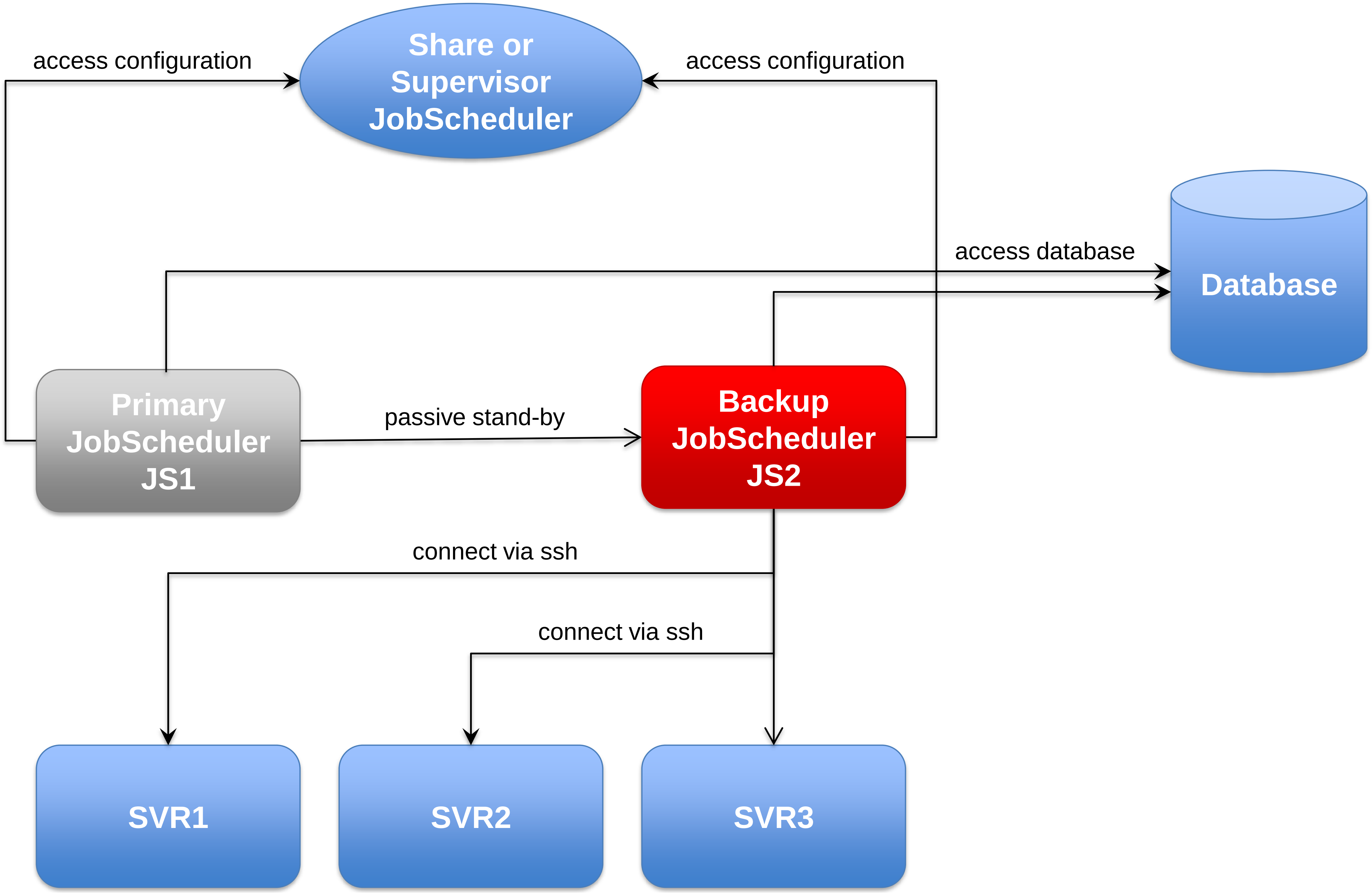
SSH Connections

JITL Jobs

- Requires a JVM per task
- Memory resources

SSH Client

- No pre-/post-processing
- No substitution of parameters in script files
- Script files have to be provided on the target system



Architecture: Active Cluster JobScheduler Master

Architecture Decision Templates: Master Active Cluster

Active Cluster

- JobScheduler Cluster members use the same database
- JobScheduler Cluster members share the workload of jobs
- All Instances operate in active mode
- All connections to servers use the ssh protocol

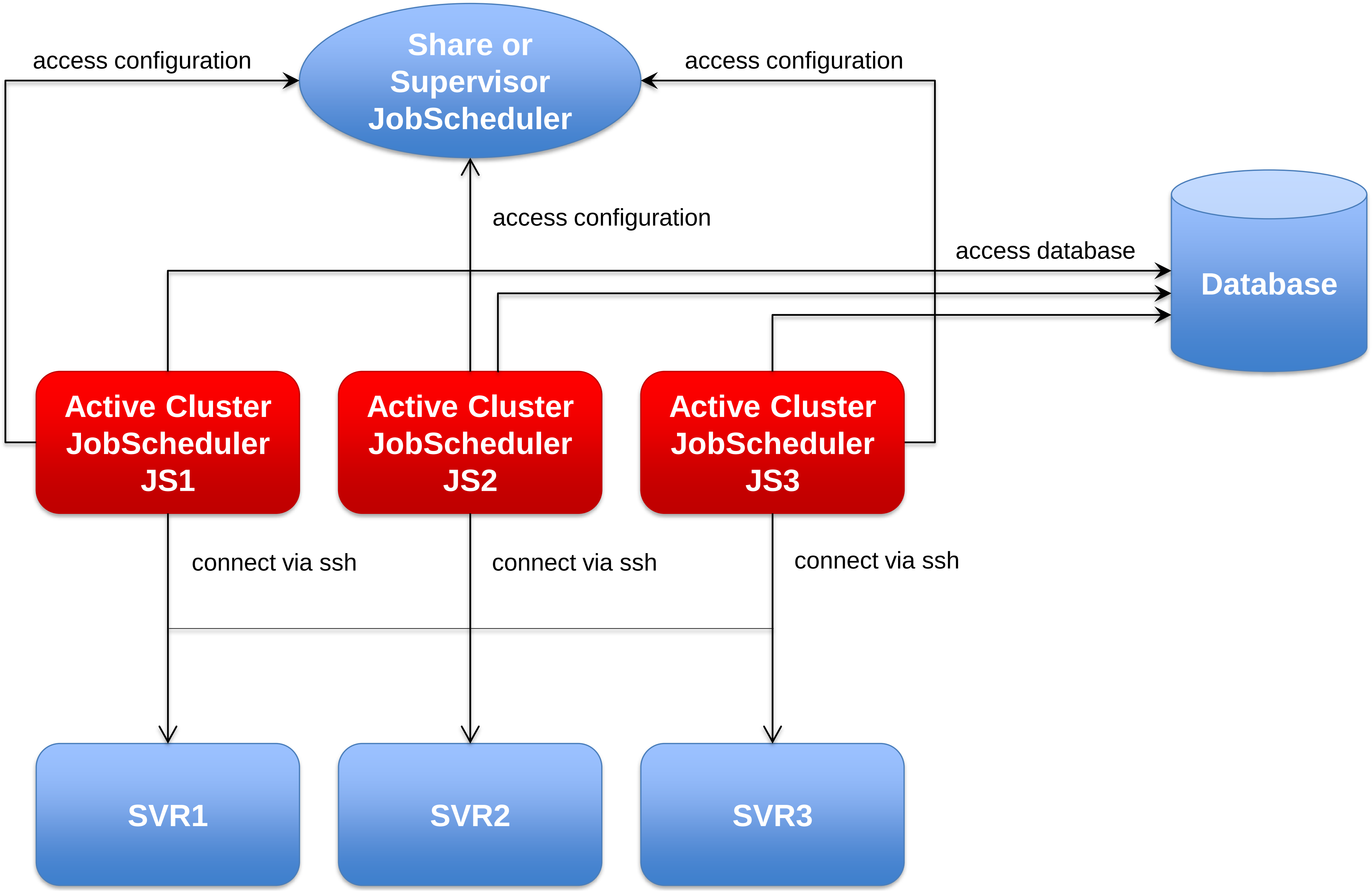
SSH Connections

JITL Jobs

- Requires a JVM per task
- Memory resouces

SSH Client

- No pre-/post-processing
- No substitution of parameters in script files
- Script files have to be provided on the target system



Architecture: Active Cluster JobScheduler with failed instance

Architecture Decision Templates: Master Active Cluster

Active Cluster

- JobScheduler Cluster members use the same database
- JobScheduler Cluster members share the workload of jobs
- All Instances operate in active mode
- All connections to servers use the ssh protocol

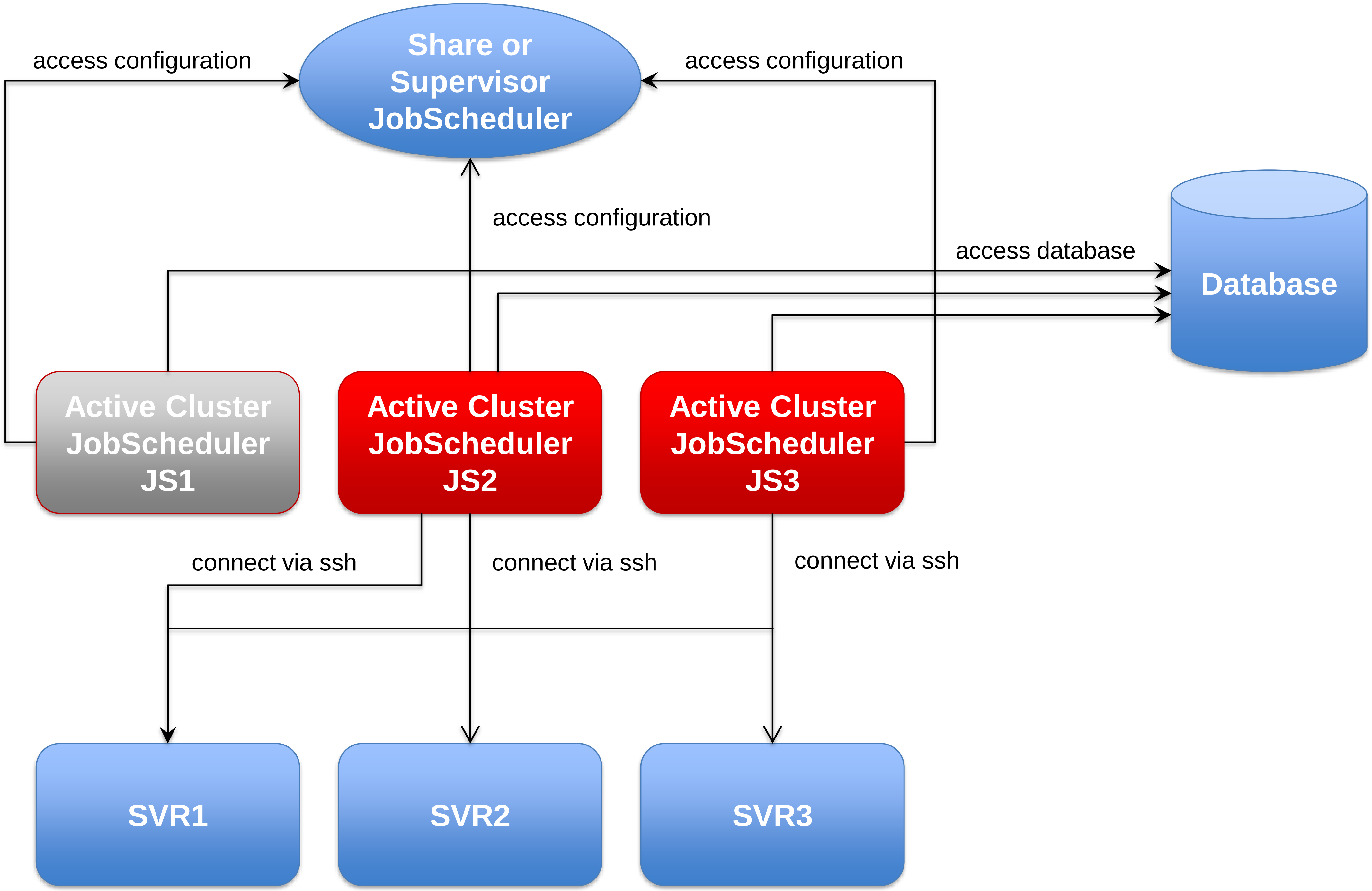
SSH Connections

JITL Jobs

- Requires a JVM per task
- Memory resources

SSH Client

- No pre-/post-processing
- No substitution of parameters in script files
- Script files have to be provided on the target system



Architecture: Master/Agent Passive Cluster JobScheduler

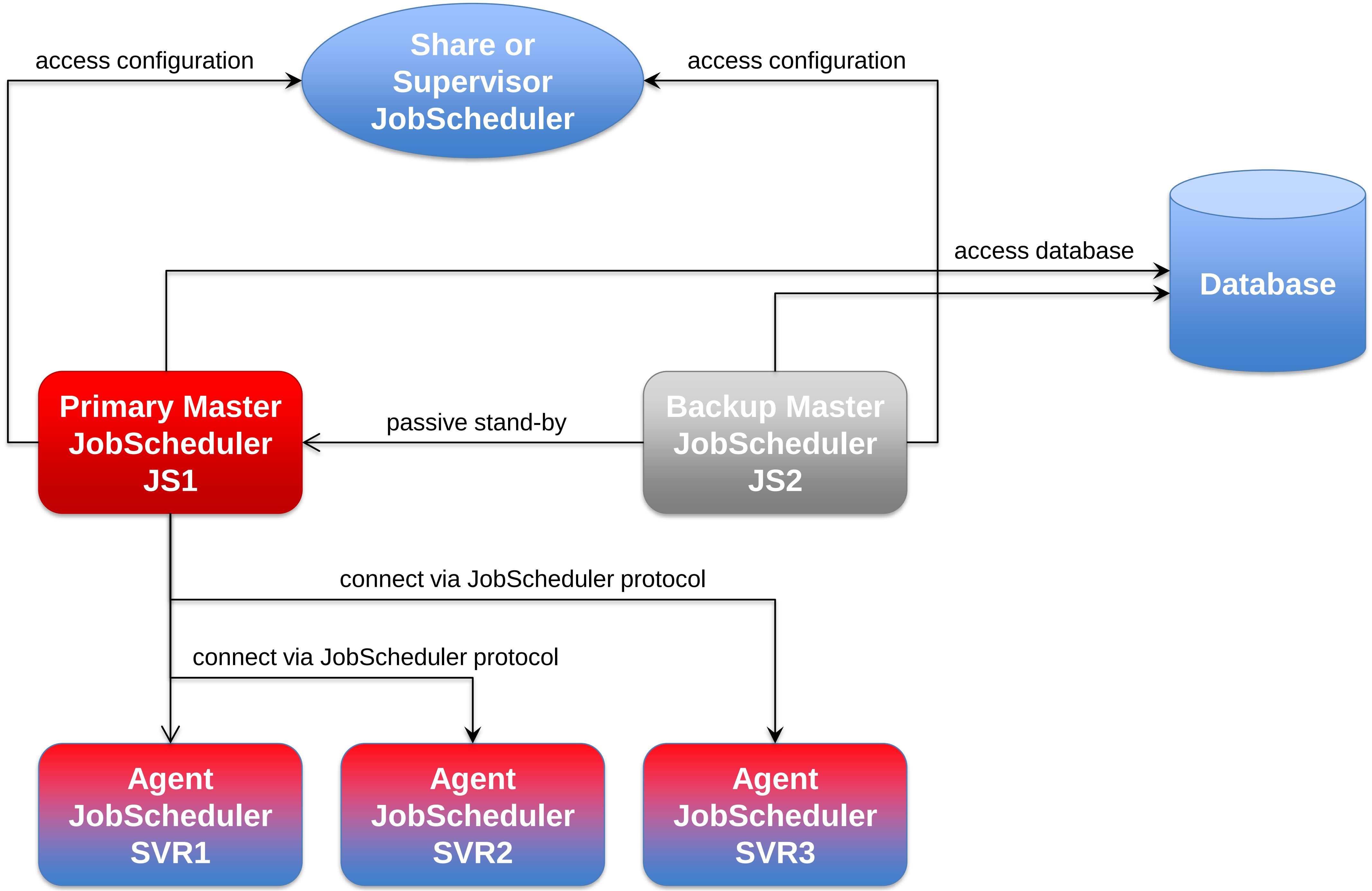
Architecture Decision Templates: Master/Agent Passive Cluster

Master/Agent Passive Cluster

- Primary and Backup JobScheduler use the same database
- Primary JobScheduler is monitored by its Backup instance
- Backup instance operates in stand-by mode
- All Cluster instances use Agents to execute jobs on remote servers
- Connections to servers use the internal protocol

Job Execution

- Jobs are executed locally per JobScheduler Agent.
- No central resources required for job execution
- Pre-/post-processing
- Use of JITL Jobs or script files with parameter substitution


access configuration
Share or Supervisor JobScheduler
access configuration
access database
Database
Primary Master JobScheduler JS1
passive stand-by
Backup Master JobScheduler JS2
connect via JobScheduler protocol
connect via JobScheduler protocol
Agent JobScheduler SVR1
Agent JobScheduler SVR2
Agent JobScheduler SVR3

Architecture: Master/Agent Active Cluster JobScheduler

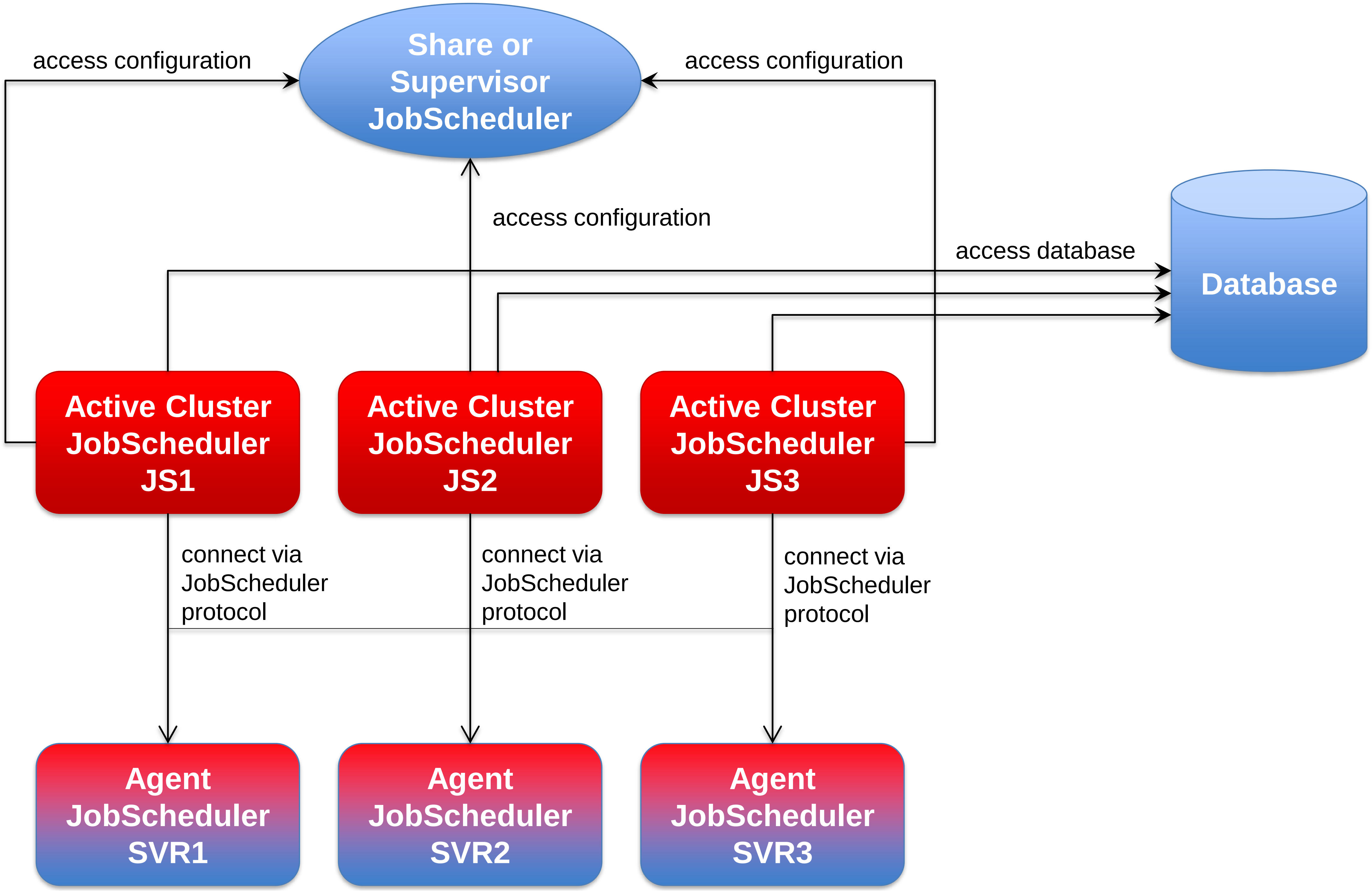
Architecture Decision Templates: Master/Agent Active Cluster

Master/Agent Active Cluster

- JobScheduler Cluster members use the same database
- JobSchedulers Cluster members share the workload of jobs
- All Instances operate in active mode
- All Cluster instances use Agents to execute jobs on remote servers

Job Execution

- Jobs are executed locally per JobScheduler Agent.
- No central resources required for job execution
- Pre-/post-processing
- Use of JITL Jobs or script files with parameter substitution


access configuration
Share or Supervisor JobScheduler
access configuration
access configuration
access database
Database
Active Cluster JobScheduler JS1
Active Cluster JobScheduler JS2
Active Cluster JobScheduler JS3
connect via JobScheduler protocol
connect via JobScheduler protocol
connect via JobScheduler protocol
Agent JobScheduler SVR1
Agent JobScheduler SVR2
Agent JobScheduler SVR3

Architecture: Supervisor for Master Passive Cluster

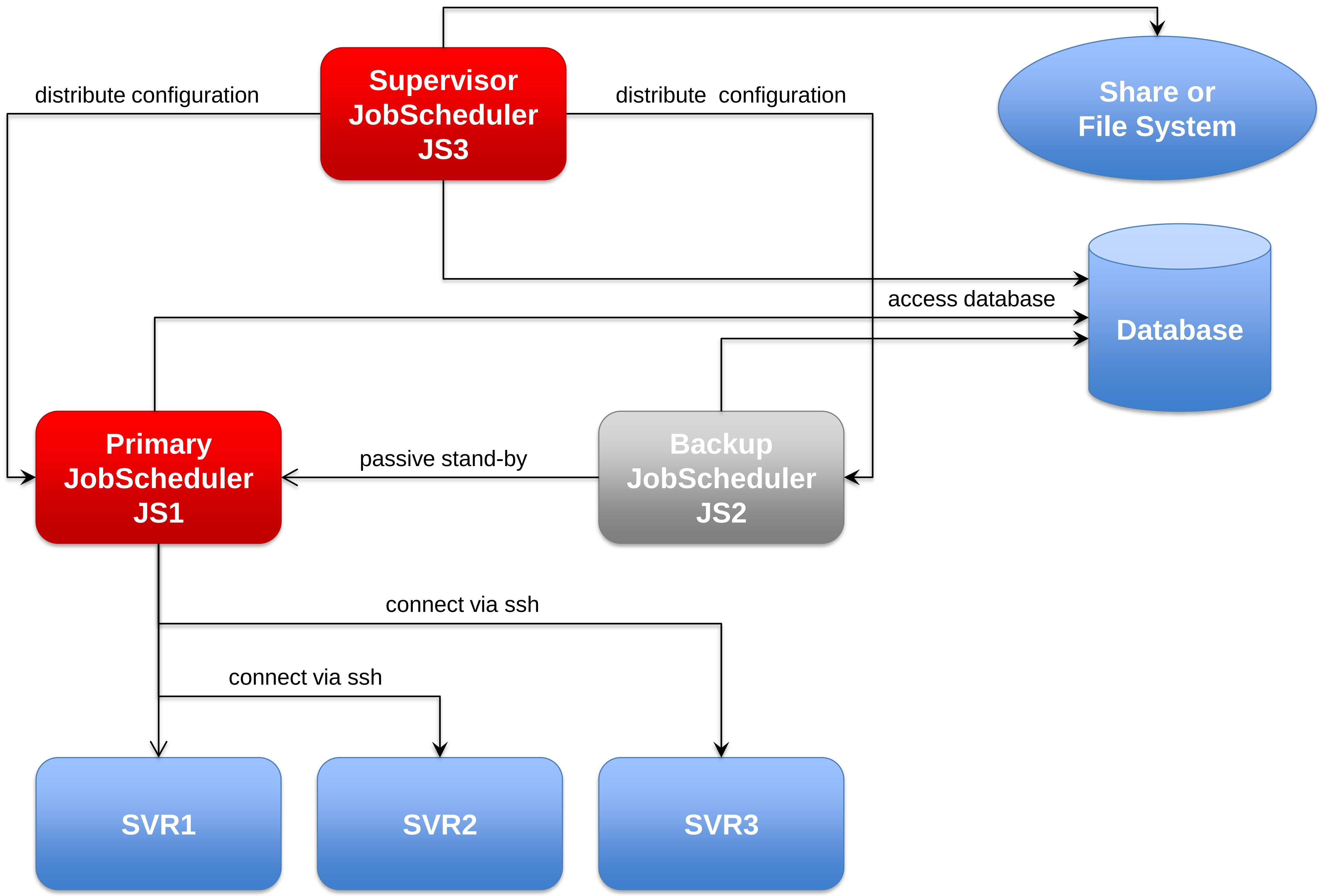
Architecture Decision Templates: Supervisor JobScheduler

Passive Cluster

- Primary and Backup JobScheduler use the same database
- Primary JobScheduler is monitored by its Backup instance
- Backup instance operates in stand-by mode
- All connections to servers use the ssh protocol

Supervisor JobScheduler

- Distribute configuration to Primary and Backup JobScheduler instances



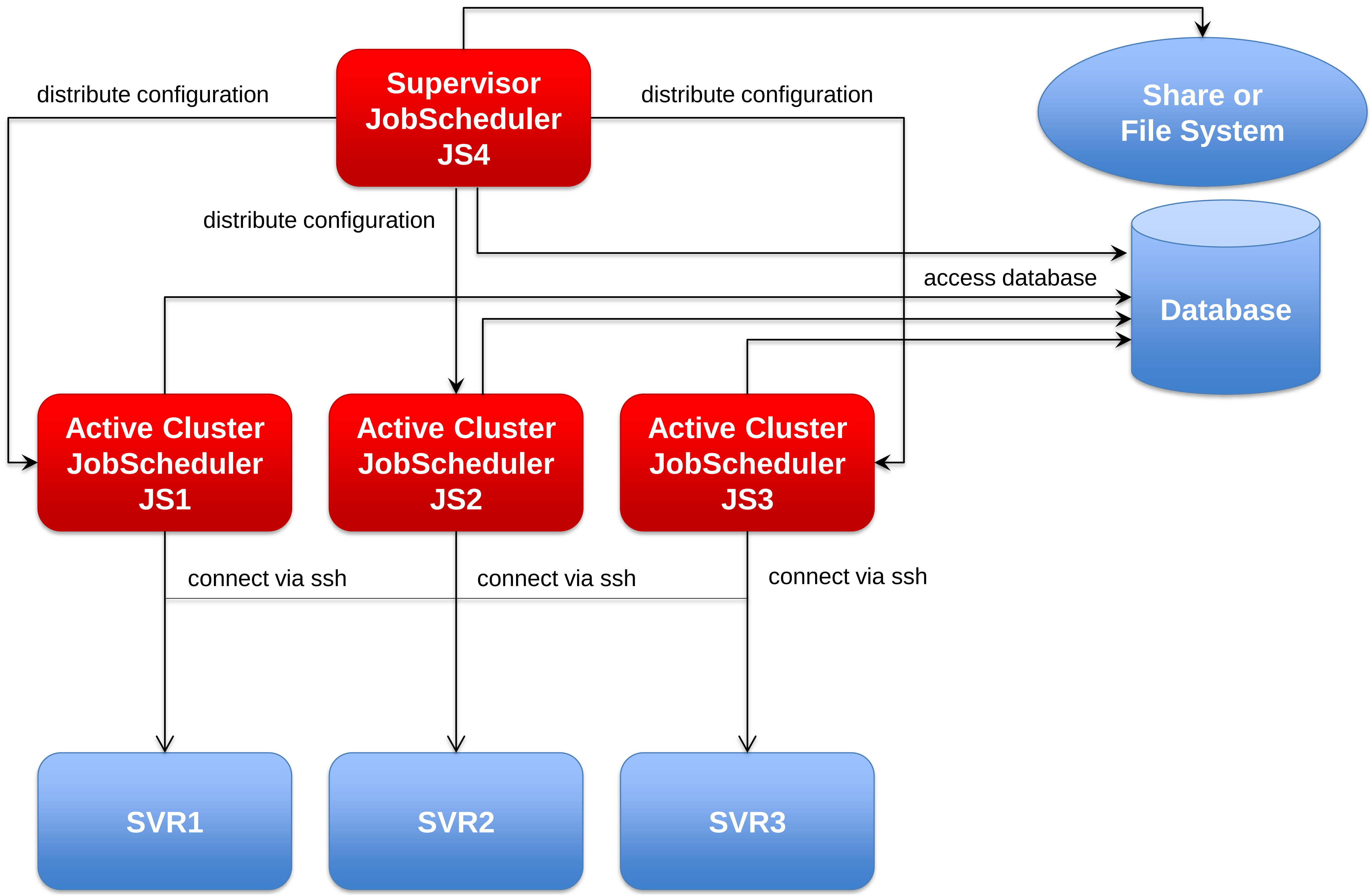
Architecture: Supervisor for Master Active Cluster

Active Workload JobScheduler Cluster

- JobScheduler Cluster members use the same database
- JobScheduler Cluster members share the workload of jobs
- All Instances operate in active mode
- All connections to servers use the ssh protocol

Supervisor JobScheduler

- Distribute configuration to Cluster JobScheduler instances



Architecture: Supervisor for Master/Agent Active Cluster

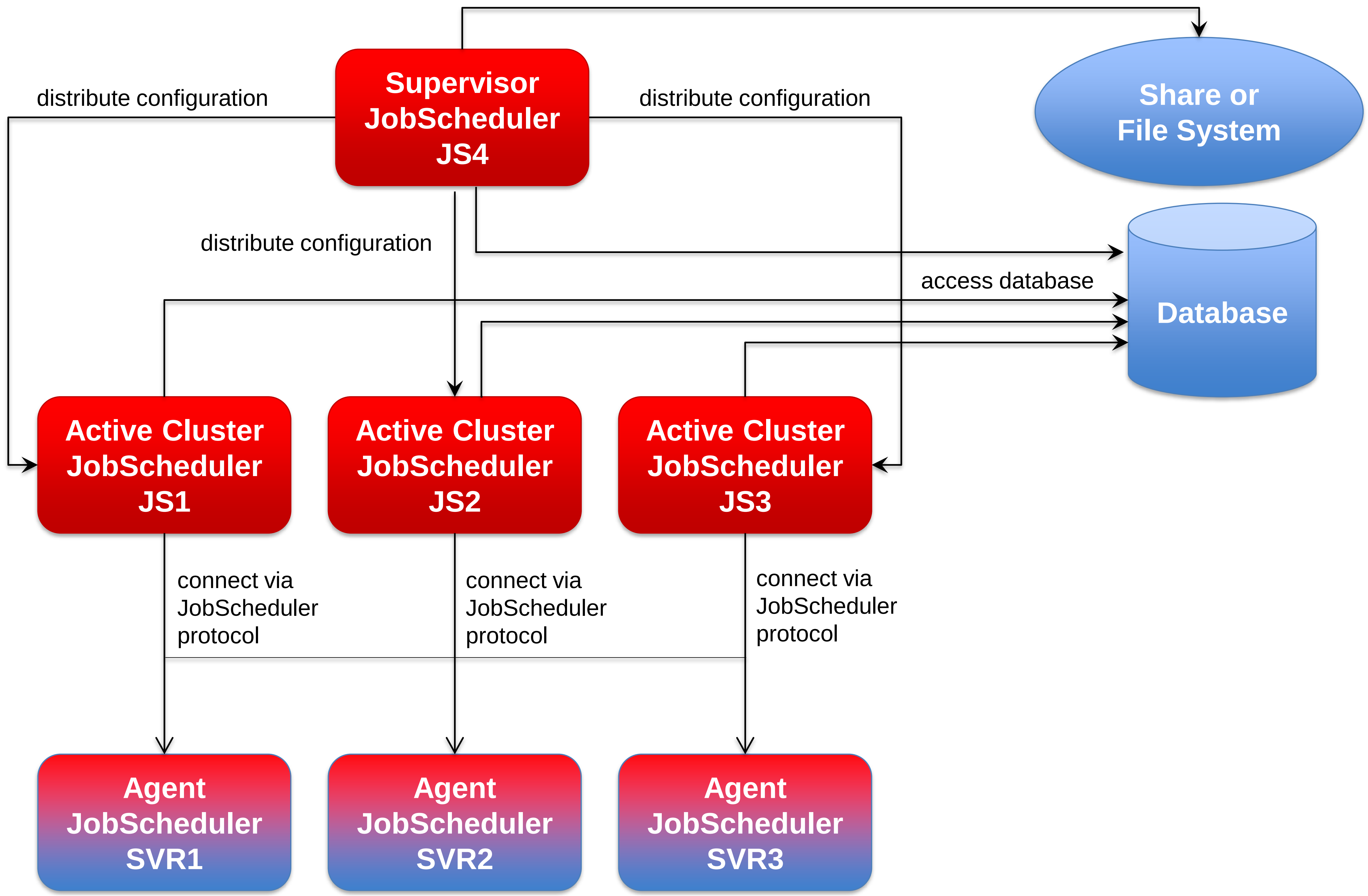
Architecture Decision Templates: Supervisor JobScheduler

Master/Agent Active Cluster

- JobScheduler Cluster members use the same database
- JobScheduler Cluster members share the workload of jobs
- All Instances operate in active mode
- All Cluster instances use Agents to execute jobs on remote servers

Supervisor JobScheduler

- Distribute configuration to Cluster JobScheduler instances


Supervisor JobScheduler JS4
Share or File System
distribute configuration
distribute configuration
distribute configuration
access database
Database
Active Cluster JobScheduler JS1
Active Cluster JobScheduler JS2
Active Cluster JobScheduler JS3
connect via JobScheduler protocol
connect via JobScheduler protocol
connect via JobScheduler protocol
Agent JobScheduler SVR1
Agent JobScheduler SVR2
Agent JobScheduler SVR3

Architecture: Supervisor for Unclustered JobScheduler

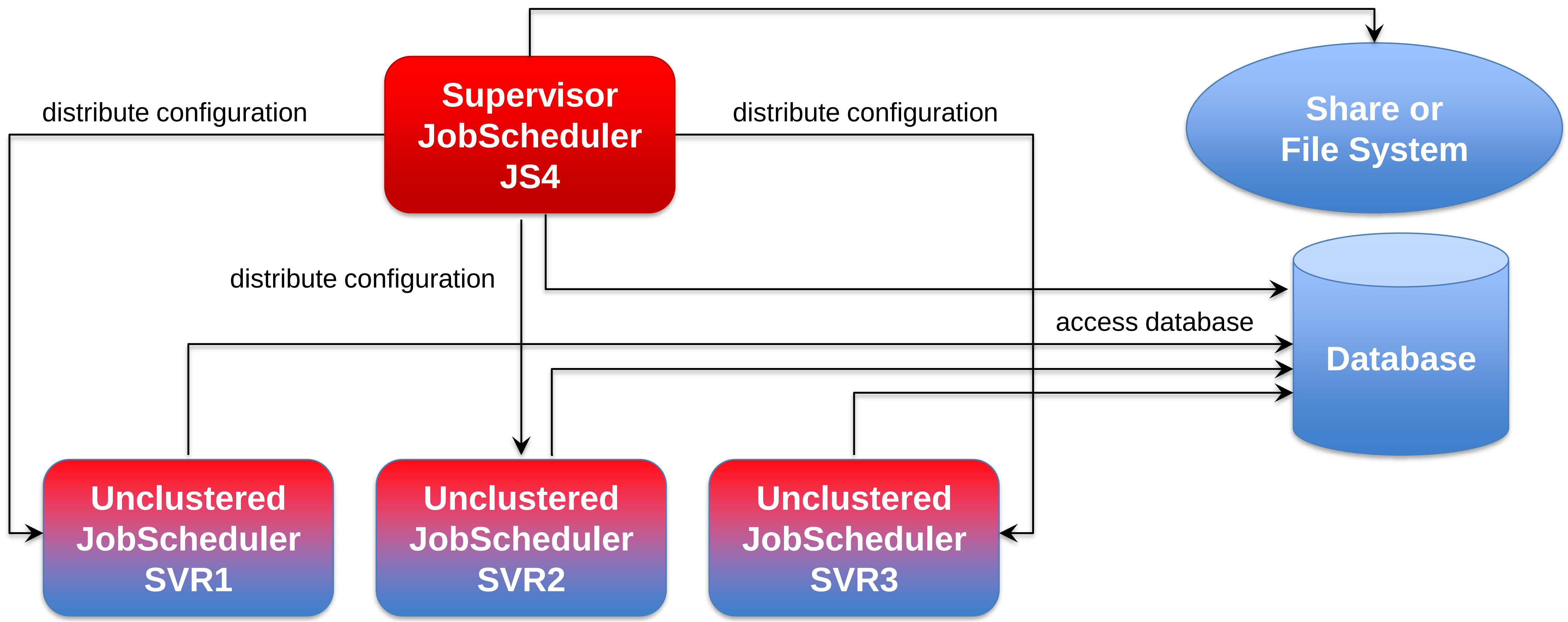
Architecture Decision Templates: Supervisor JobScheduler

Unclustered JobSchedulers

- JobSchedulers use the same database
- JobSchedulers operate independently from each other
- All Instances operate in active mode

Supervisor JobScheduler

- Distribute configuration to JobScheduler instances



Questions?

Comments?

Feedback?

Software- und
Organisations-
Service GmbH

Giesebrechtstr. 15
D-10629 Berlin

info@sos-berlin.com
http://www.sos-berlin.com