



JS7 JobScheduler Architecture

Security Architecture:

Communication, Configuration, Operation

**Information for
Interested Parties**



■ Secure Communication

- Network Connections
- Certificate Preparation
- Certificate Deployment

■ Secure Configuration

- Secure Deployment: Security Level Low
- Secure Deployment: Security Level Medium
- Secure Deployment: Security Level High
- Secure Roll-out

■ Secure Operation

- Access Management
- Credential Management

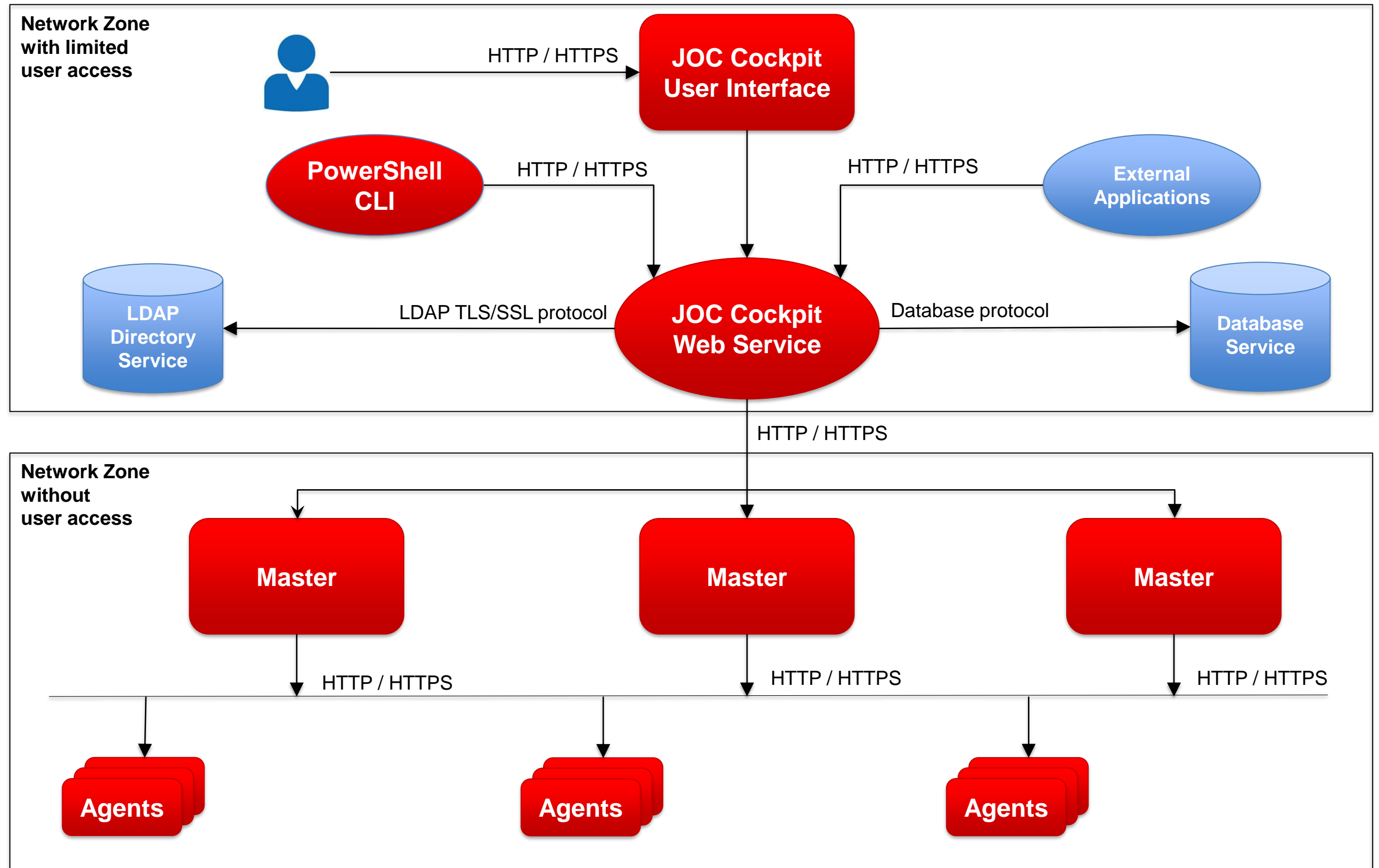
Secure Network Connections

Network Zone with restricted user access

- Users have limited access that requires authentication.
- Connections to JOC Cockpit are authenticated by the Web Service that can be configured to use LDAP.
- Use of HTTPS for network connections is supported.

Network Zone without user access

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



Server Certificates

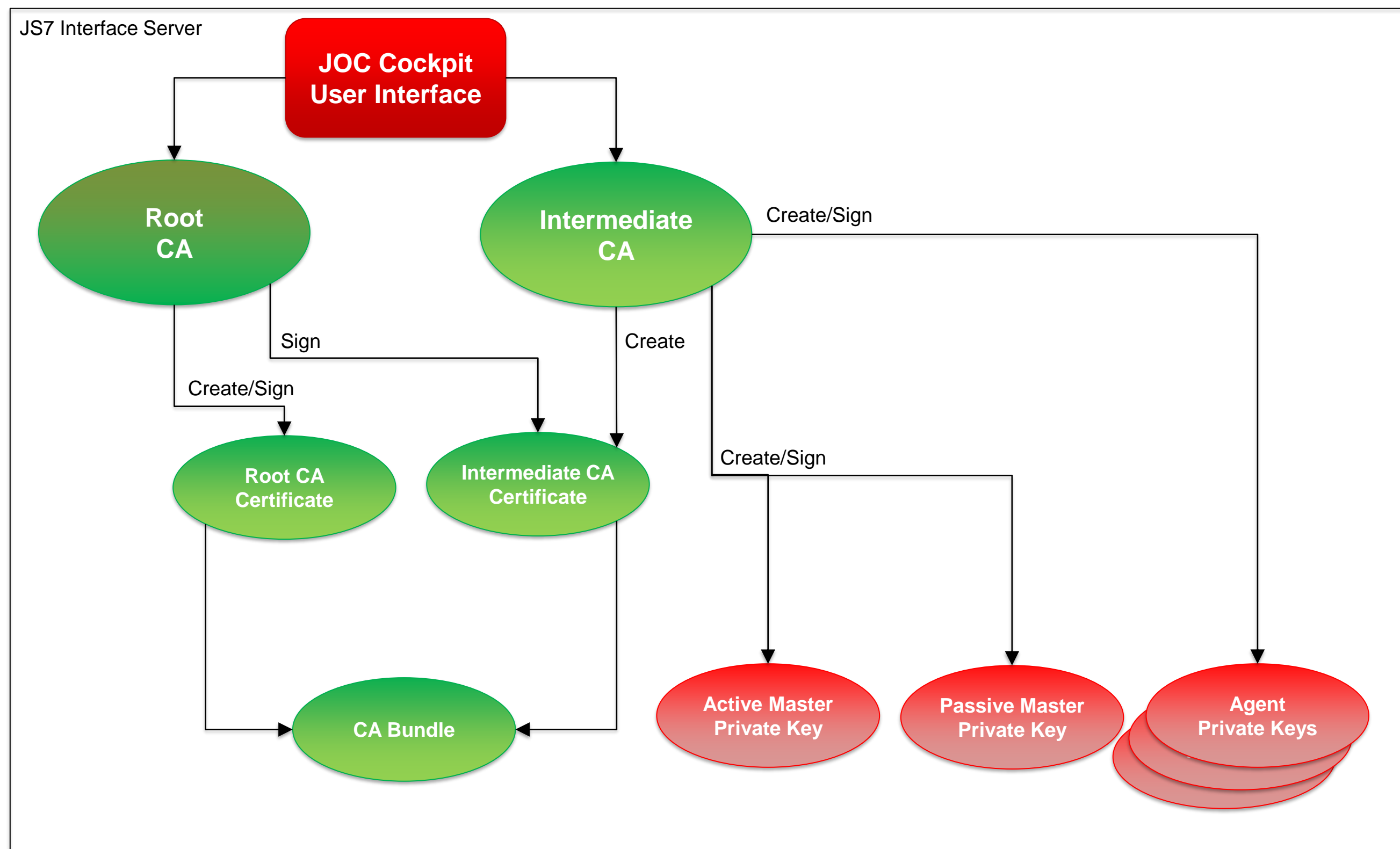
- Server Certificates are required to secure network connection by HTTPS.
- Certificates are managed by a central CA or by the CA provided with JOC Cockpit.

Root CA / Intermediate CA

- The Certificate Authority (CA) is used to create the Root CA certificate and Intermediate CA certificates.
- Both certificates are bundled and made available to any Master and Agent instances.

Master / Agent Certificates

- The Intermediate CA creates and signs the Private Key and Certificate for each Master and Agent.
- The CA Bundle and the instance's Private Key are deployed to the respective instance of a Master/Agent.

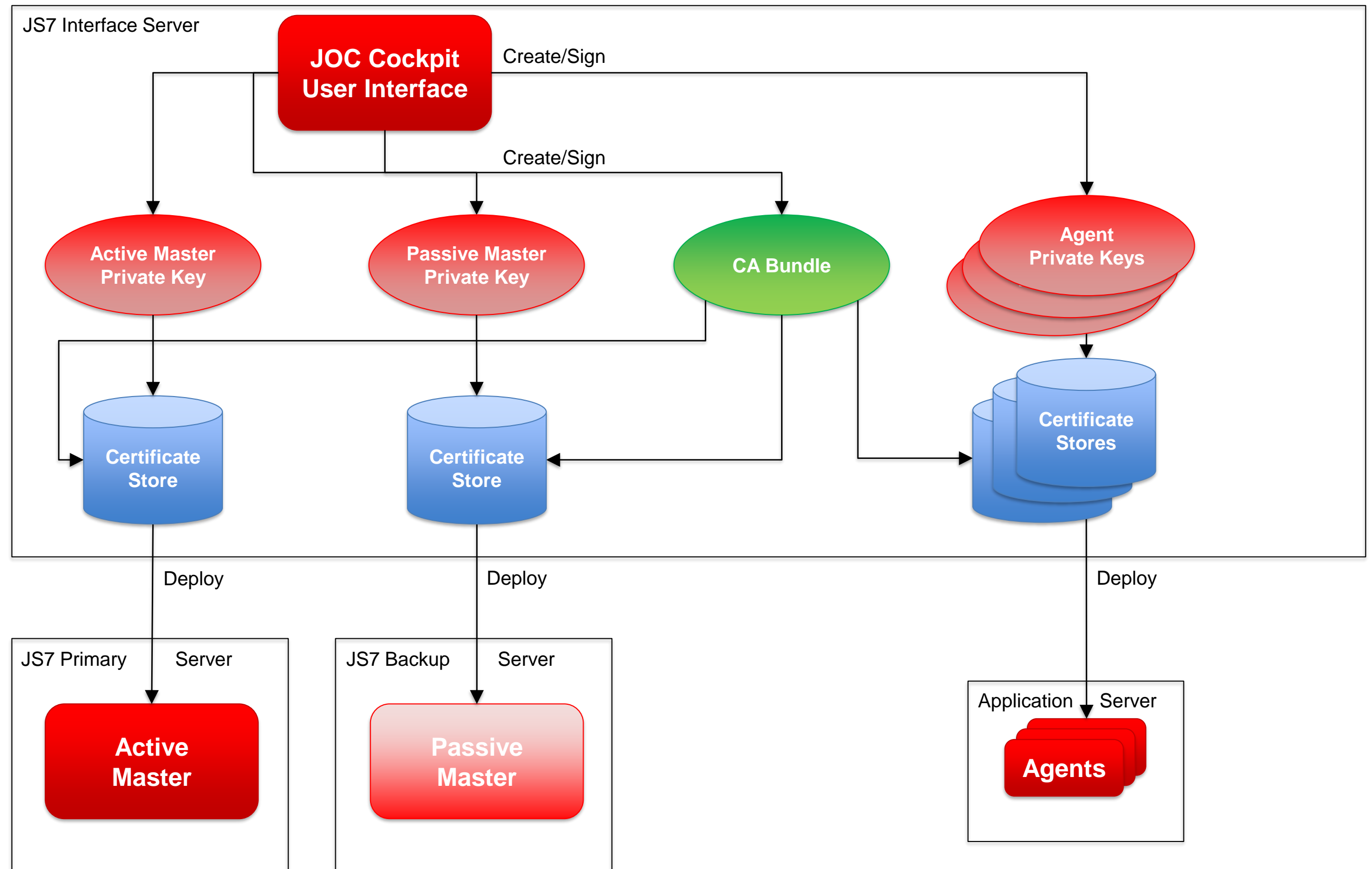


Private Keys / CA Bundle

- The Certificate Authority (CA) adds the Root CA certificate and Intermediate CA certificates to a Bundle.
- The CA Bundle together with the Private Key is added to a Certificate Store that is managed for each Master/Agent instance.

Deployment

- The Certificate Store is deployed to each Master/Agent instance.
- The transfer of Certificate Stores to Master/Agent instances is performed by file transfer scripts or is integrated with the user's deployment solution.





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JOC Cockpit Signing

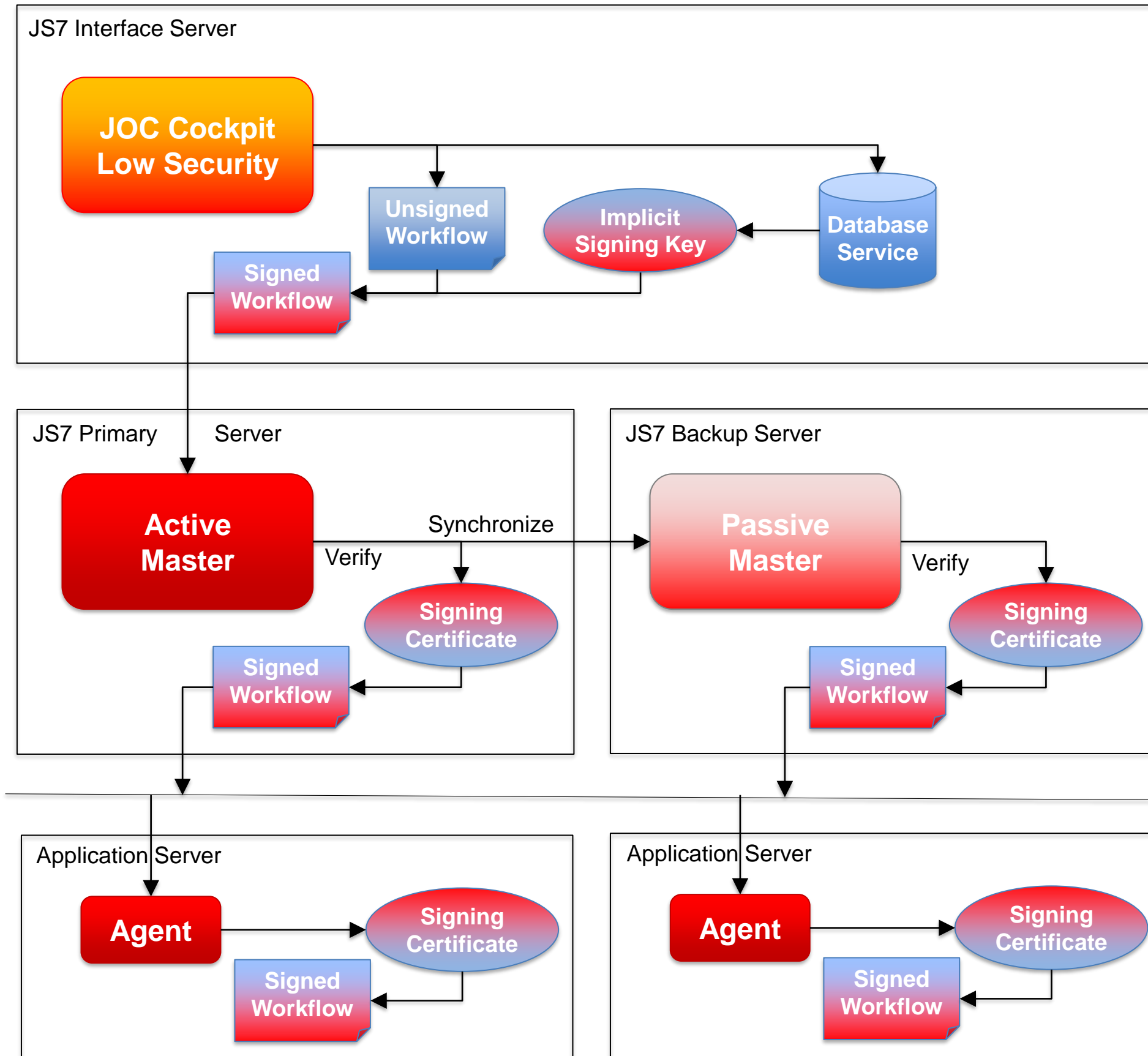
- Workflows are signed for deployment using a Signing Key from the database.
- The signature is deployed with the workflow.

Master Signature Check

- Workflows are checked if they match the signature provided with certificates available to the Master and otherwise are denied.
- Similar check is performed by the Passive Master that requires availability of the same certificates.

Agent Signature Check

- Workflows are checked if they match the signature provided with certificates available to the Agent.
- Workflows are not accepted in case of failed signature checks.

**Implicit Signing**

- Workflows are implicitly signed for deployment.
- Deployments by any user make use of the same Signing Key.
- Deployment is a single click operation in the user interface.

Security Level Low

- JOC Cockpit offers built-in signing operations for workflows.
- Signed workflows are not associated with individual users.
- The Signing Key might be copied or compromised as it is accessible from the database.

JOC Cockpit Signing

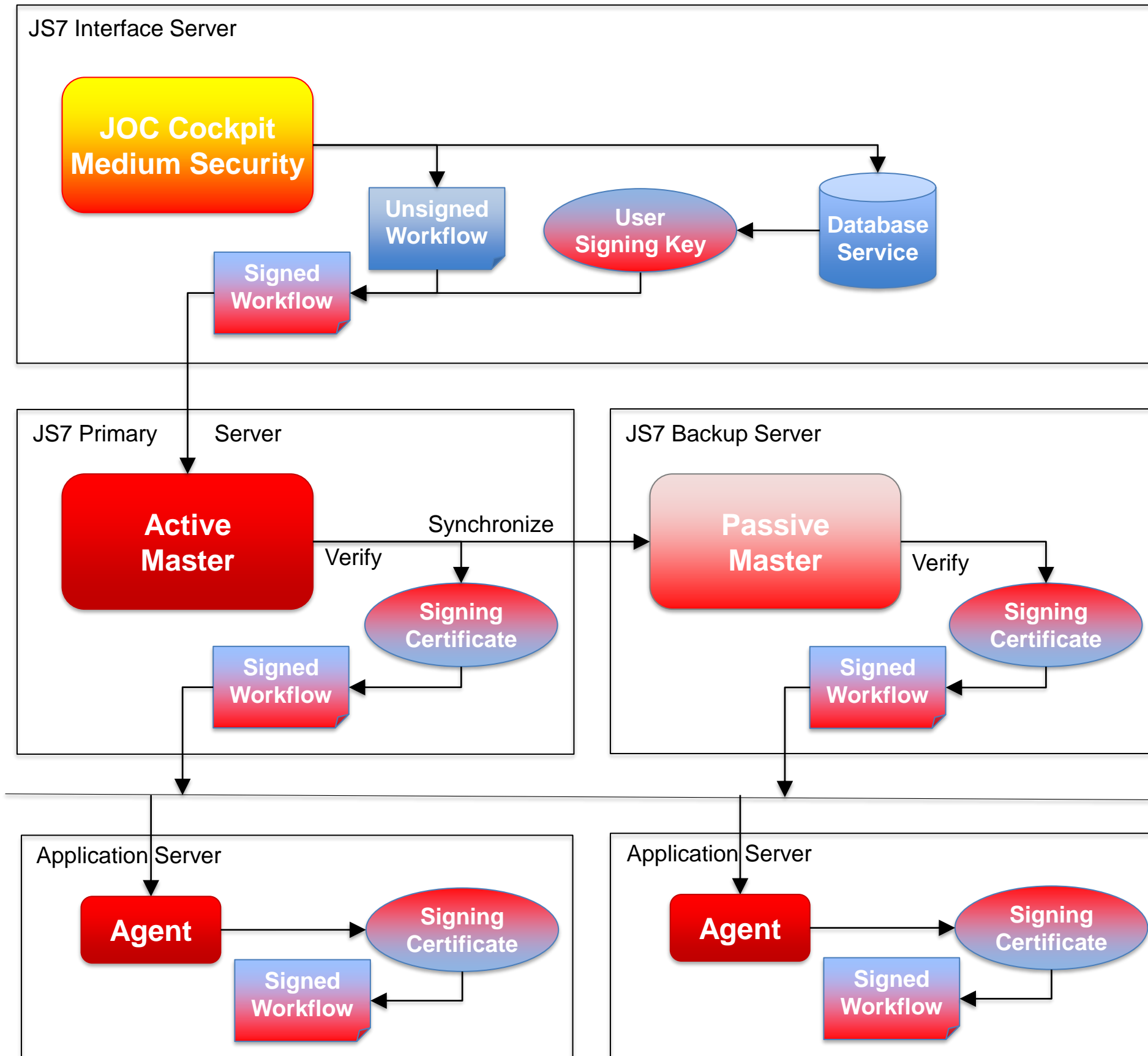
- Workflows are signed for deployment using a Signing Key from the database.
- The signature is deployed with the workflow.

Master Signature Check

- Workflows are checked if they match the signature provided with certificates available to the Master and otherwise are denied.
- Similar check is performed by the Passive Master that requires availability of the same certificates.

Agent Signature Check

- Workflows are checked if they match the signature provided with certificates available to the Agent.
- Workflows are not accepted in case of failed signature checks.

**User based Signing**

- Workflows are signed individually per user for deployment with an individual Signing Key.
- Deployment is a single click operation in the user interface.

Security Level Medium

- JOC Cockpit offers built-in signing operations for workflows.
- Each signed workflow is associated with a user.
- The Signing Key might be copied or compromised as it is accessible from the database.

External Signing

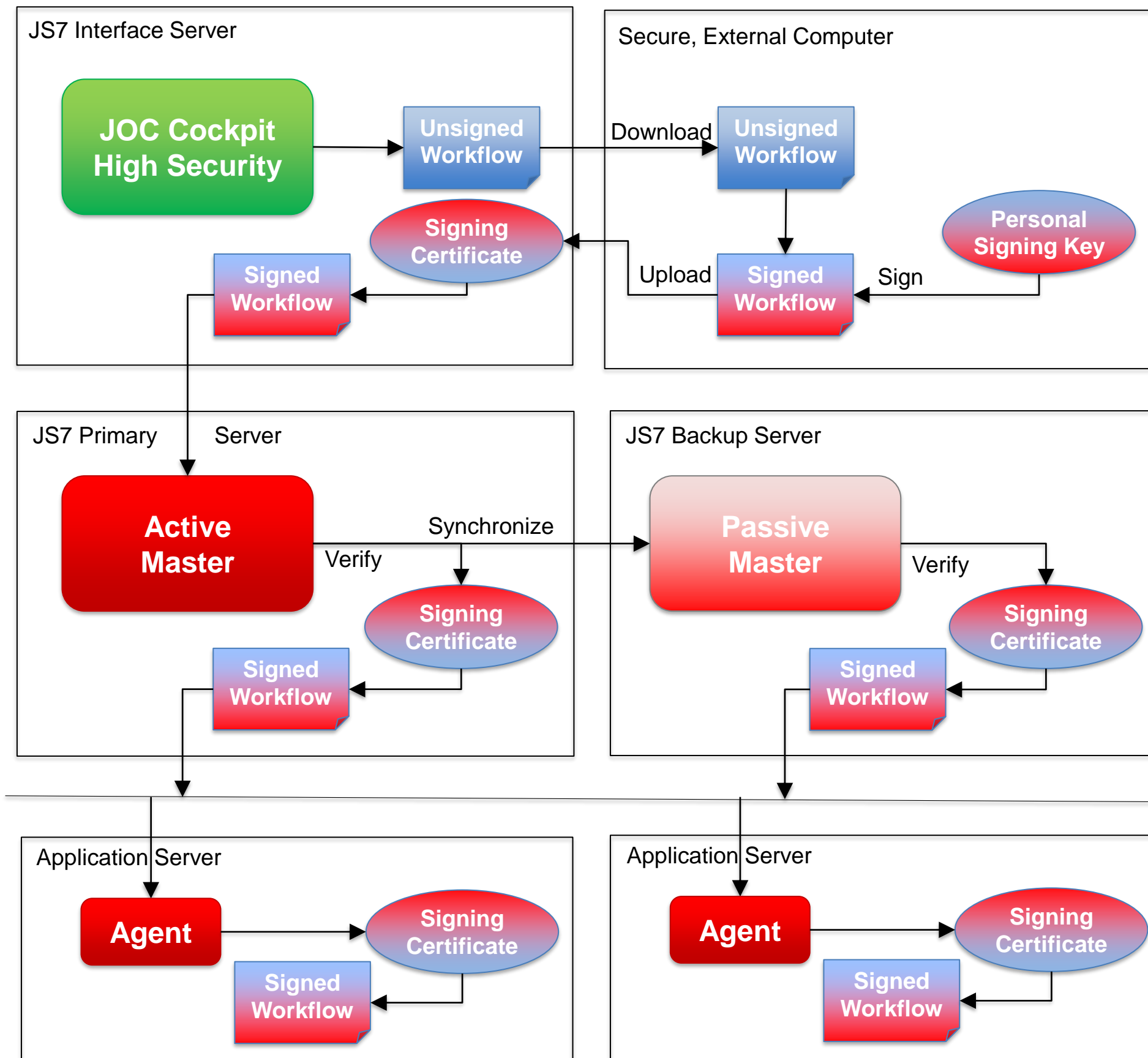
- Workflows are signed for deployment performing the signing from a secure, external computer.
- The signature is deployed with the workflow.

Master Signature Check

- Workflows are checked if they match the signature provided with certificates available to the Master and otherwise are denied.
- Similar check is performed by the Passive Master that requires availability of the same certificates.

Agent Signature Check

- Workflows are checked if they match the signature provided with certificates available to the Agent.
- Workflows are not accepted in case of failed signature checks.

**External Signing**

- Workflows are downloaded to a secure, external computer. The user's Signing Key might be provided by portable media.
- Signing is performed with any tool accepted by company standards, e.g. OpenSSL.
- The workflows and resulting signature files are added to an archive file and are uploaded.

Security Level High

- JOC Cockpit offers no built-in signing operations for workflows.
- Workflows have to be signed externally to be deployable.
- The Signing Key is used outside of JOC Cockpit.
- A signed workflow is associated with a user (non-repudiability).

External Signing

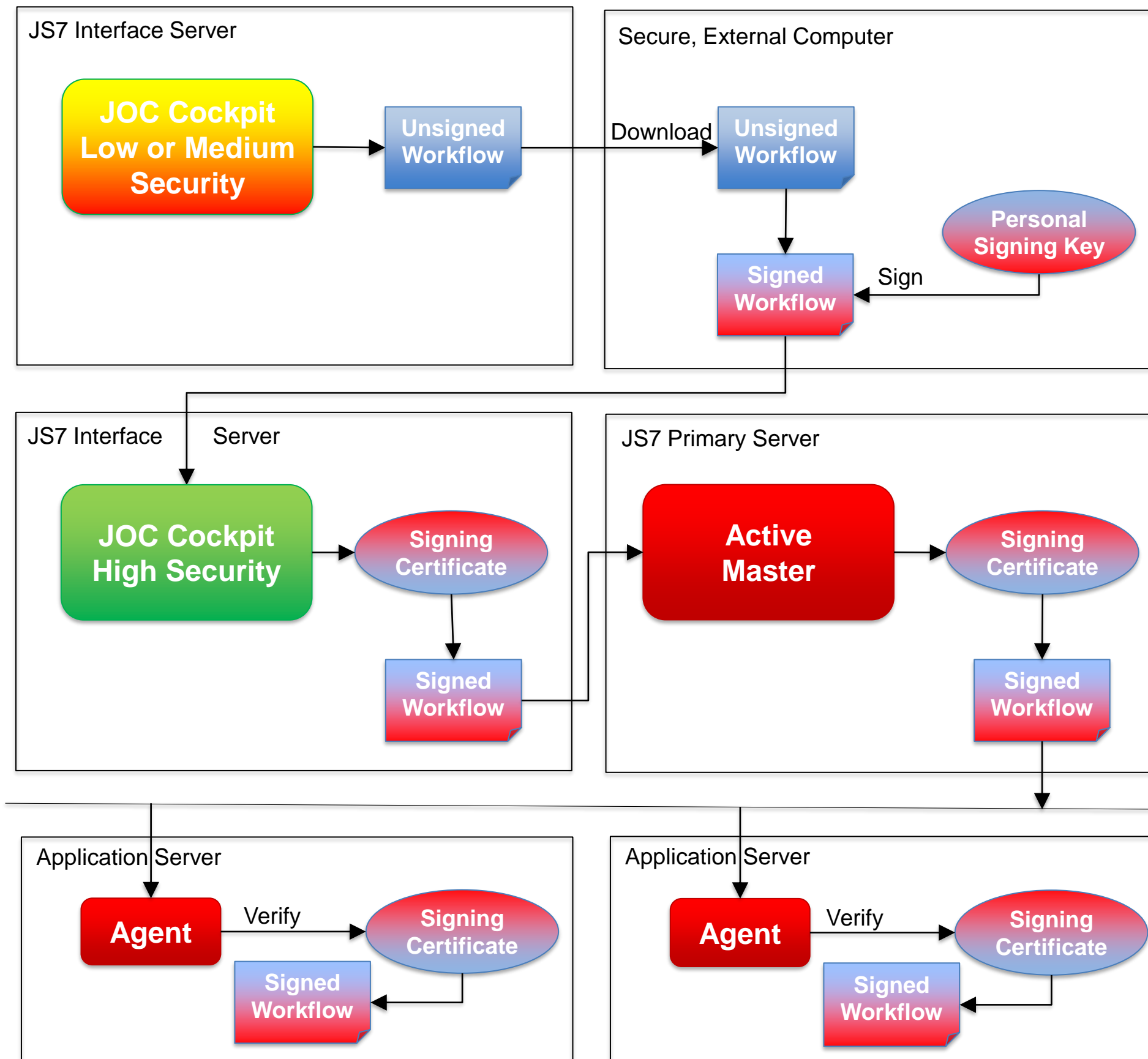
- Workflows are signed for deployment performing the signing from a secure, external computer.
- The signature is deployed with the workflow.

Master Signature Check

- Workflows are checked if they match the signature provided with certificates available to the Master and otherwise are denied.
- Similar check is performed by the Passive Master that requires availability of the same certificates.

Agent Signature Check

- Workflows are checked if they match the signature provided with certificates available to the Agent.
- Workflows are not accepted in case of failed signature checks.

**External Signing**

- Workflows are downloaded to a secure, external computer. The user's Signing Key might be provided by portable media.
- Signing is performed with any tool accepted by company standards, e.g. OpenSSL.
- The workflows and resulting signature files are added to an archive file and are uploaded to a secure JOC Cockpit instance.

Secure Roll-out

- A secure JOC Cockpit instance accepts signed workflows only.
- There is no possibility to sign a workflow within a secure JOC Cockpit instance.
- A secure JOC Cockpit instance will accept workflows only if their signatures match the signing certificate.



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Questions?
Comments?
Feedback?

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