



# High Availability PI System

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**Empowering Business in Real Time**  
**PI Infrastructure for the Enterprise**

# High Availability PI System

1. The PI Server Story
  - Architecture Review
  - Features, Benefits, Best Practices
  - Going Forward
2. AF High Availability
  - AF/SQL Server Architecture
  - Demo of AF 2.1
  - Feature Summary
3. Closing Words



Interfaces, Server, SDK, Clients

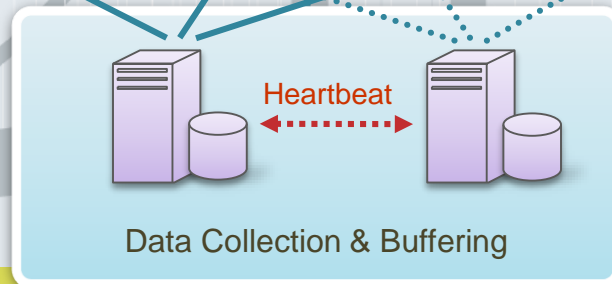
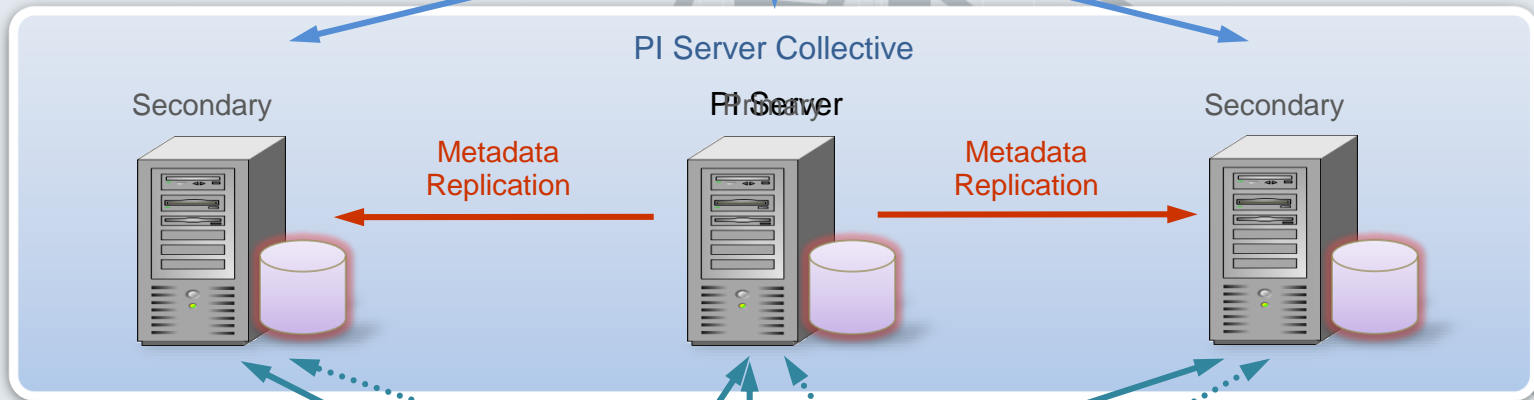
# PI High Availability



# PI HA Architecture



ProcessBook, DataLink, RtWebParts, Notifications, ACE, etc.



# PI HA Features & Benefits

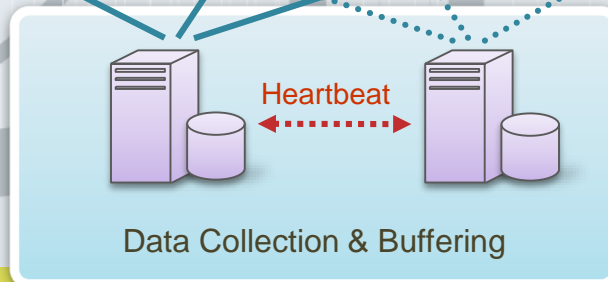
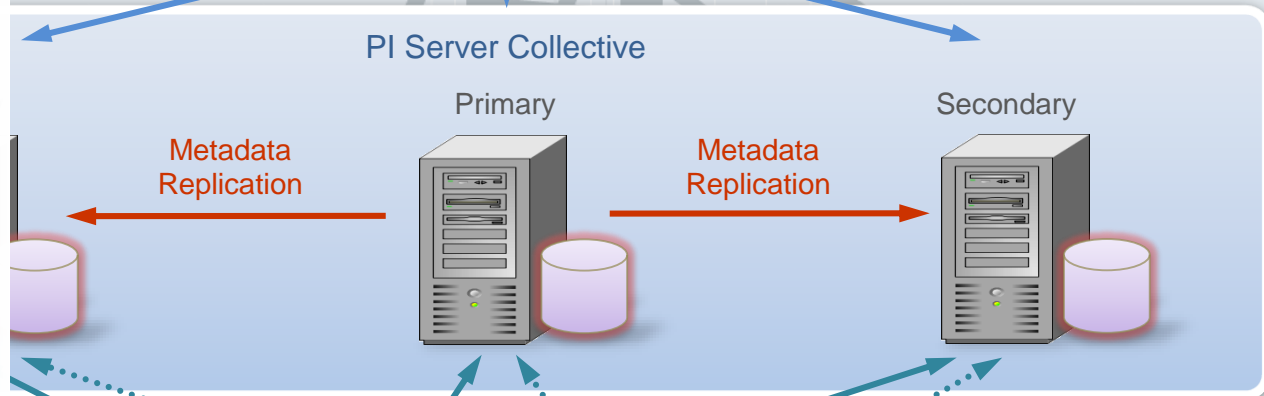
- PI Server Discovery
- Automatic Client Failover
- Load Distribution

- N-Way Redundancy
- Standard Hardware
- Low Bandwidth
- Rolling Upgrades
- Easy Maintenance and Repair

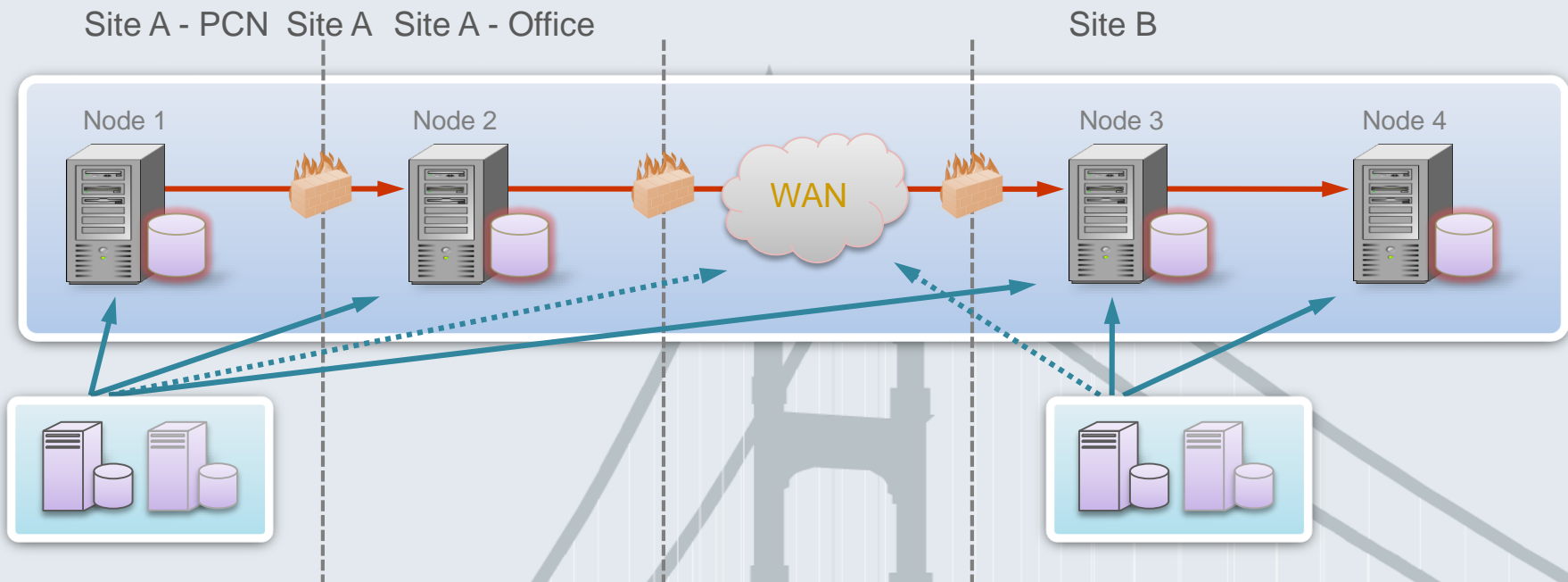
- Hot Failover
- Offline Startup
- PI API Compatibility
- Data Buffering and N-Way Fanning



PI SDK Library



# PI HA Deployment, Best Practices



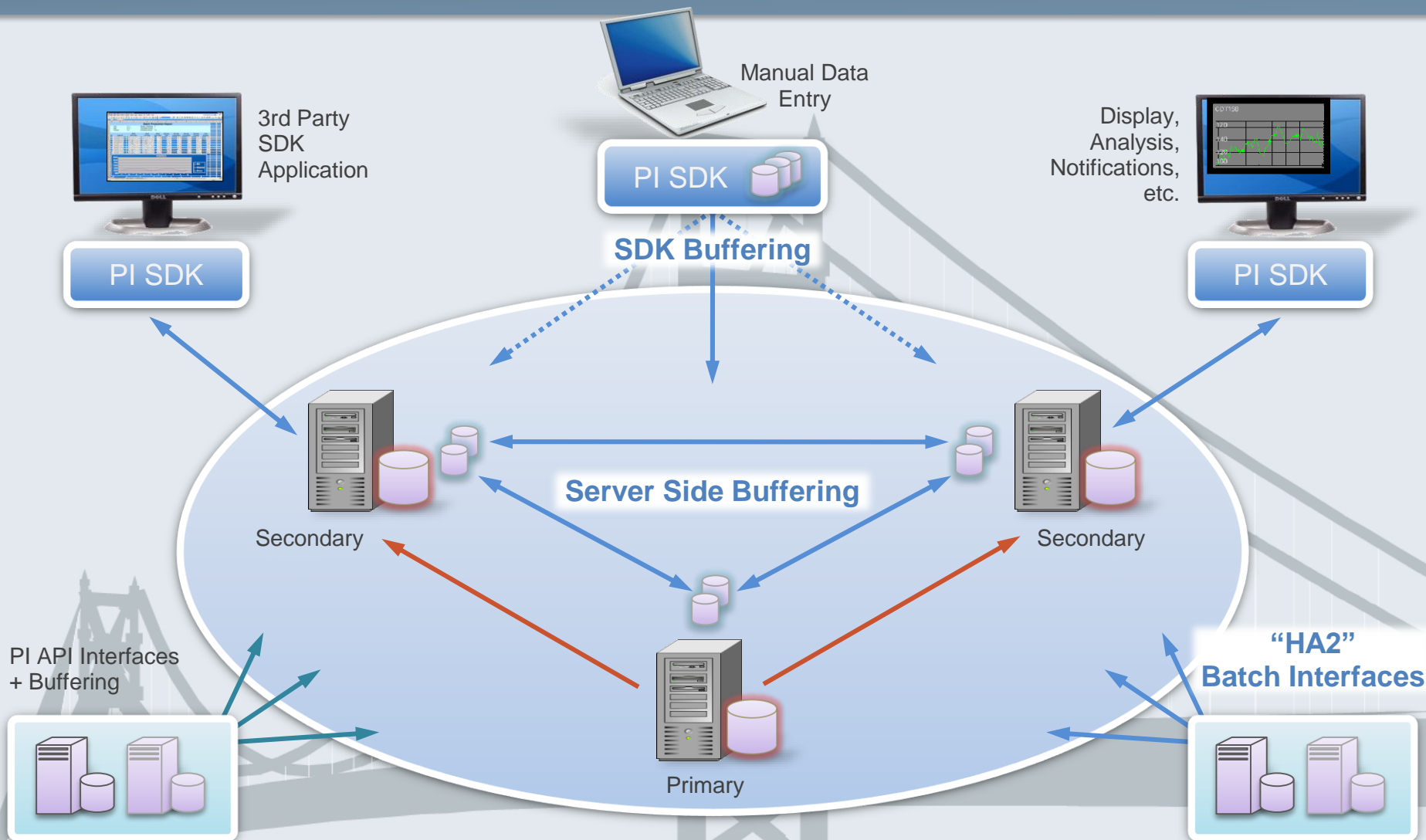
	Goals/Value	Node 1	Node 2	Node 3	Node 4	Interfaces
1	Simple HA	Site A	Site A	-	-	Site A
2	Security Isolation	Site A, PCN	Site A, Office	-	-	Site A
3	Load Distribution	Site A, PCN	Site A, Office	Site A, Office	-	Site A
4	Disaster Recovery	Site A, PCN	Site A, Office	Site B		Site A + Site B
5	All Combined	Site A, PCN	Site A, Office	Site B	Site B	Site A + Site B

# PI High Availability FAQs



1. How is PI HA different than Clustered/FT hardware?
2. What about VMware HA and VMotion?
3. How do I size the hardware for HA servers?
4. What is the network bandwidth required for PI HA?
5. Interface buffering: BufServ or Buffer Subsystem?
6. Are my third-party applications compatible with HA?
7. Can archives be shared among collective members?
8. Do I still need PI Server backups?
9. How does HA change technical support?
10. What about manual data entry or PI Batch replication?

# PI HA Developments "HA2"





AF 2.0 ⇒ AF 2.1

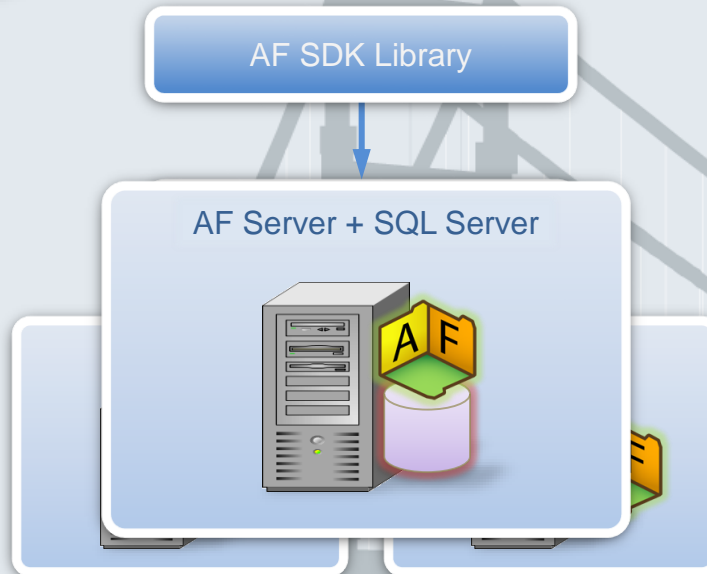
# AF High Availability



# AF 2.0 + Network Load Balancer



PI System Explorer

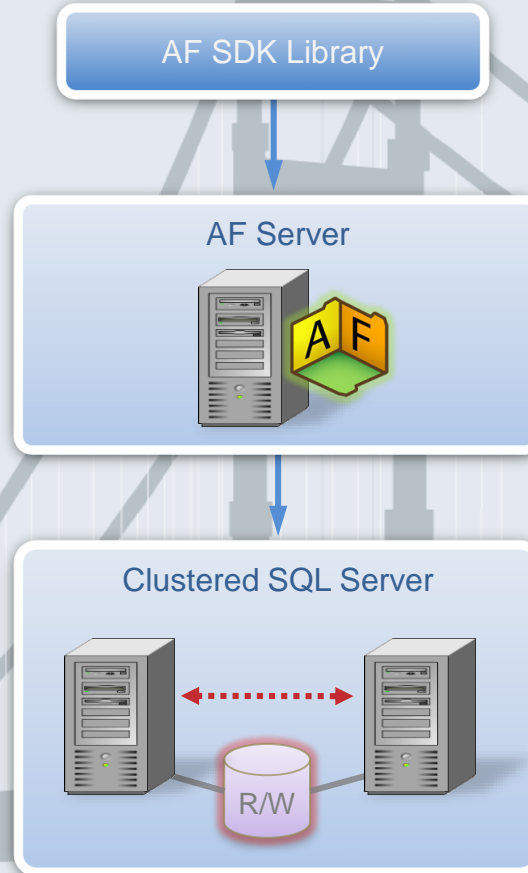


- |                     |  |
|---------------------|--|
| SQL Server License: | <input checked="" type="checkbox"/> Express    |
|                     | <input checked="" type="checkbox"/> Standard   |
|                     | <input checked="" type="checkbox"/> Enterprise |

# AF 2.1 + Clustered SQL Server



PI System Explorer

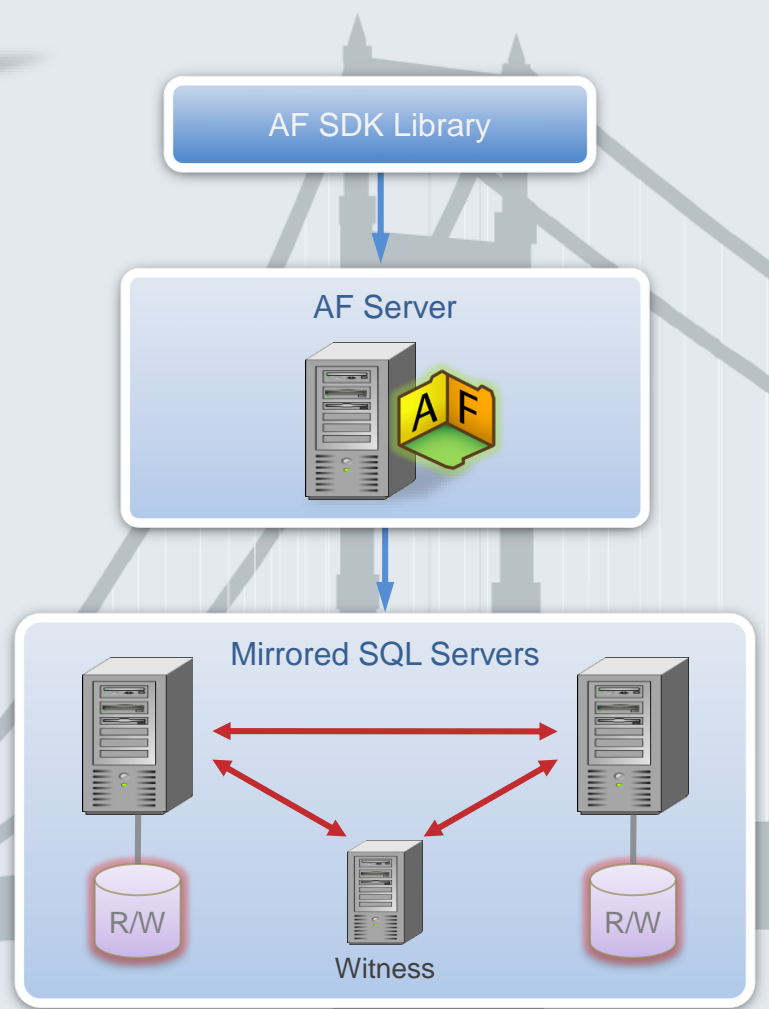


SQL Server License:	<input checked="" type="checkbox"/> Express
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# AF 2.1 + Mirrored SQL Servers



PI System Explorer



SQL Server License:	<input checked="" type="checkbox"/> Express
	<input checked="" type="checkbox"/> Standard
	<input checked="" type="checkbox"/> Enterprise

# AF 2.1 HA Collective

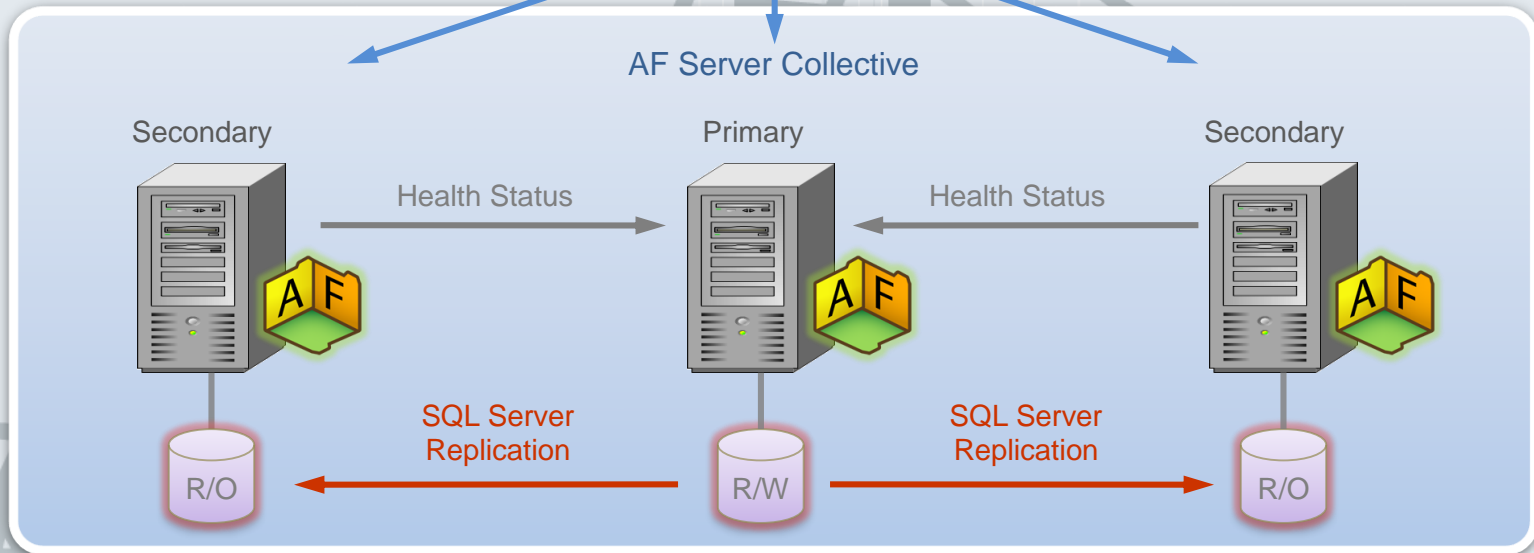


PI System Explorer



PI Notifications, AF-based PI Clients (WebParts, ProcessBook, DataLink, etc.)

AF SDK Library



SQL Server (primary)	<input checked="" type="checkbox"/> Express
	<input checked="" type="checkbox"/> Standard
	<input checked="" type="checkbox"/> Enterprise

SQL Server (secondary)	<input checked="" type="checkbox"/> Express
	<input checked="" type="checkbox"/> Standard
	<input checked="" type="checkbox"/> Enterprise

Setting up an AF Collective

# Demo: AF 2.1



# AF 2.1/SQL Server HA Deployments

	Non-HA	SQL Cluster	SQL Mirror	AF Collective (Replication)
HA Writes	No	Yes	Yes	No
HA Reads	No	Yes	Yes	Yes
Load Balanced Reads	No	No	No	Yes
Max Distance between SQL Servers	N/A	tens of meters	km	thousands of km
Read Access during Upgrade?	No	Yes	Yes	Yes
Read/Write Access during OS/SQL Upgrade?	No	Yes	Yes	No
Read/Write Access during AF upgrade?	No	No	No	Not while upgrading Primary
Special Hardware Required?	No	Yes	No	No
Minimum SQL Server Edition Required	Express	Standard	Standard	Primary: Standard Secondary: Express

HA Services

None

Good

Better

Best

# High Availability – Summary

- Broad Adoption of PI HA (PR1) – More to Come
  - Thank You!
- High Availability Coming in AF 2.1
- HA = OSIsoft Core Tenet
- Key Engineering Principles
  - Install in place
  - Leverage Microsoft technologies
  - High value for investment

