

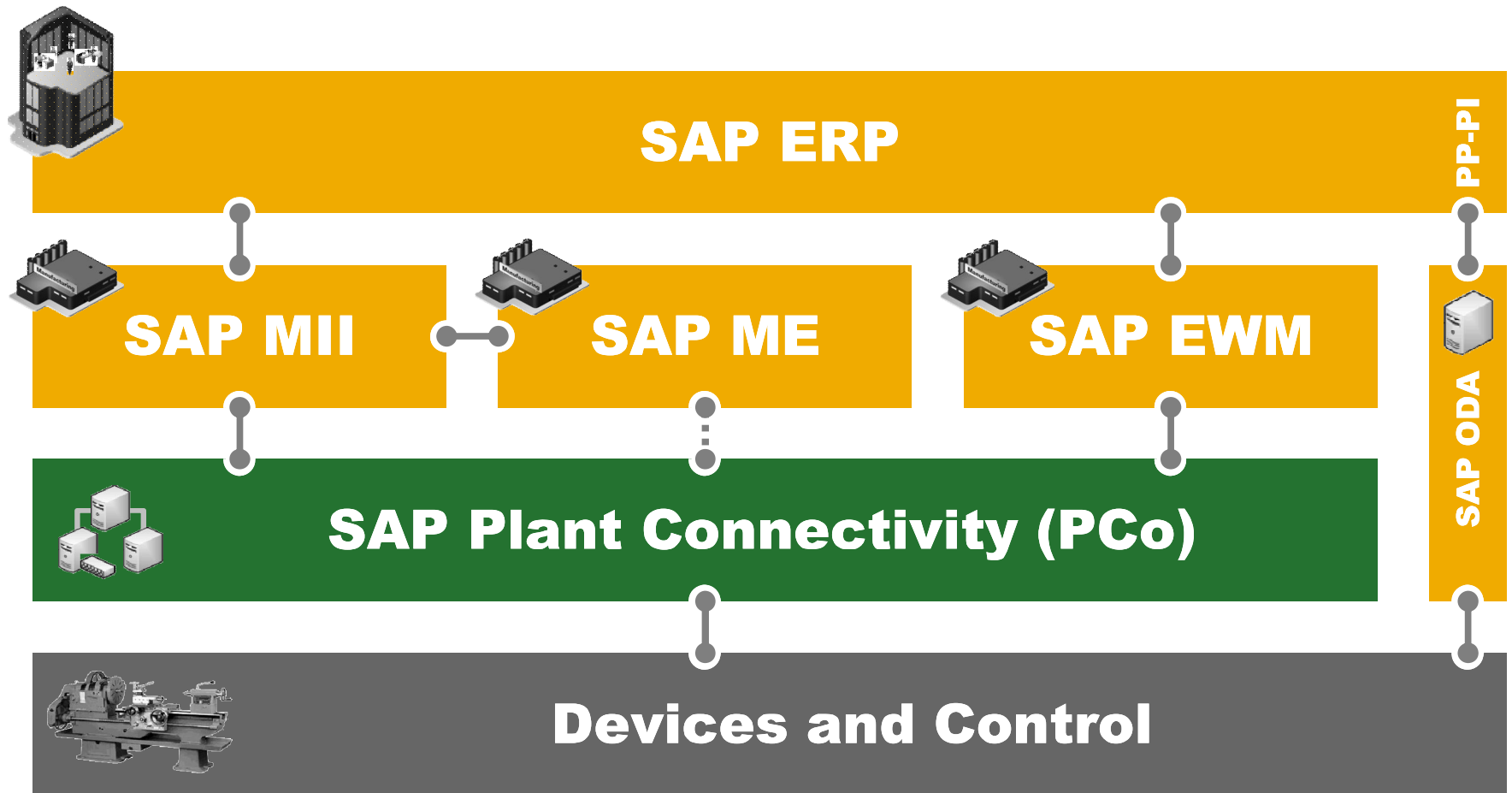
# SAP Plant Connectivity

SAP PCo Development  
April, 2011

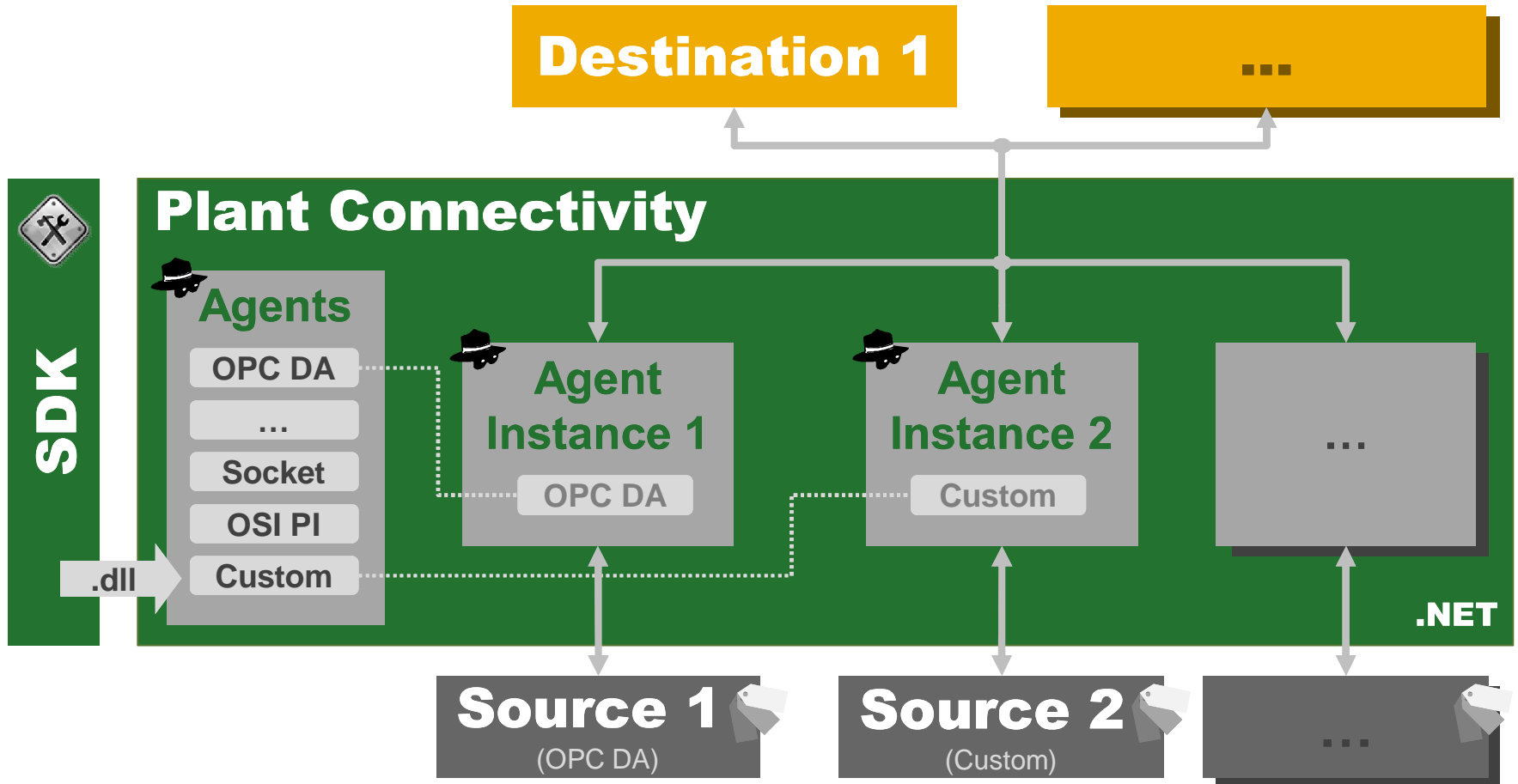




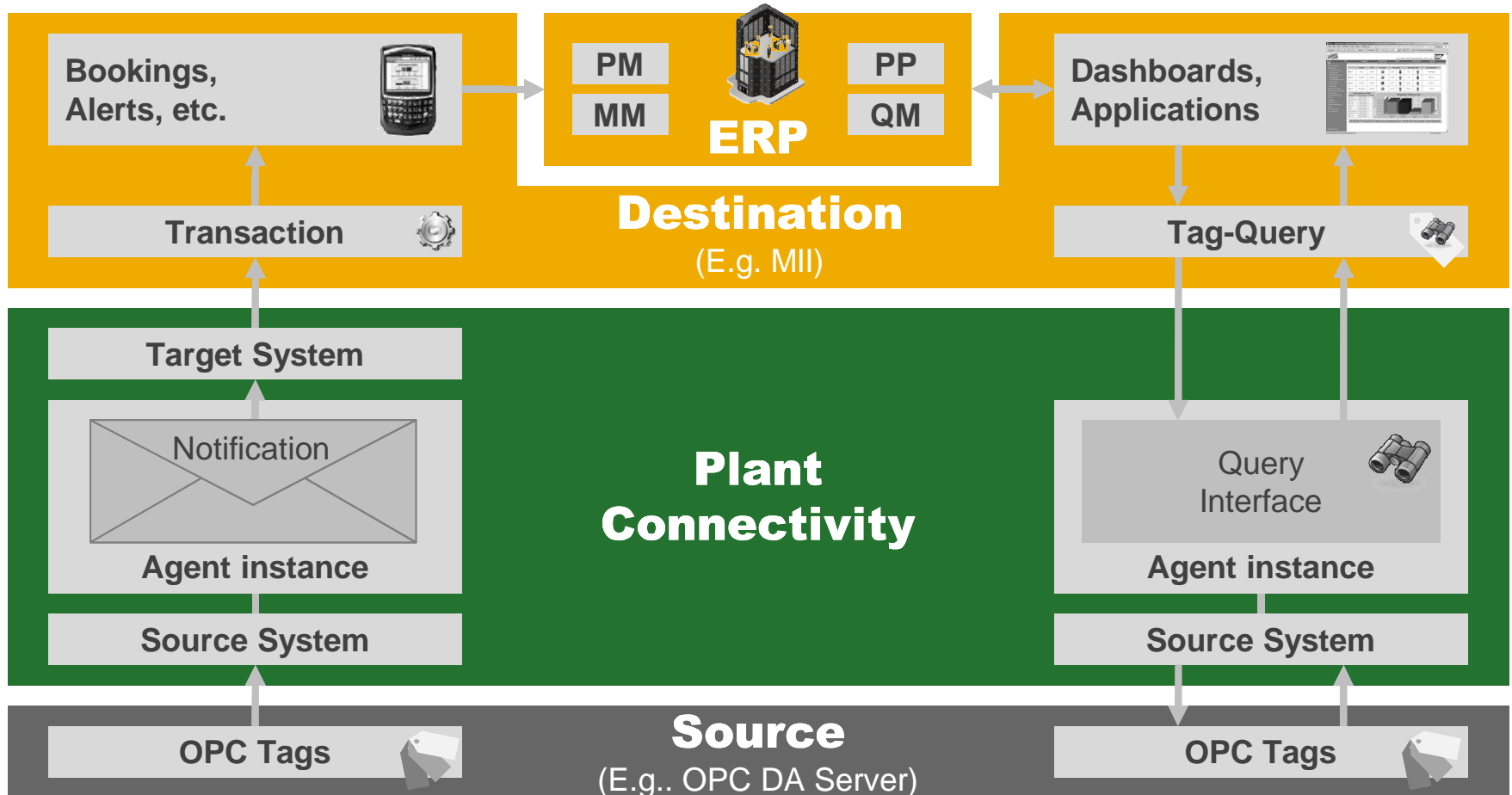
# Support of Device Connectivity by SAP



# Plant Connectivity: Overview

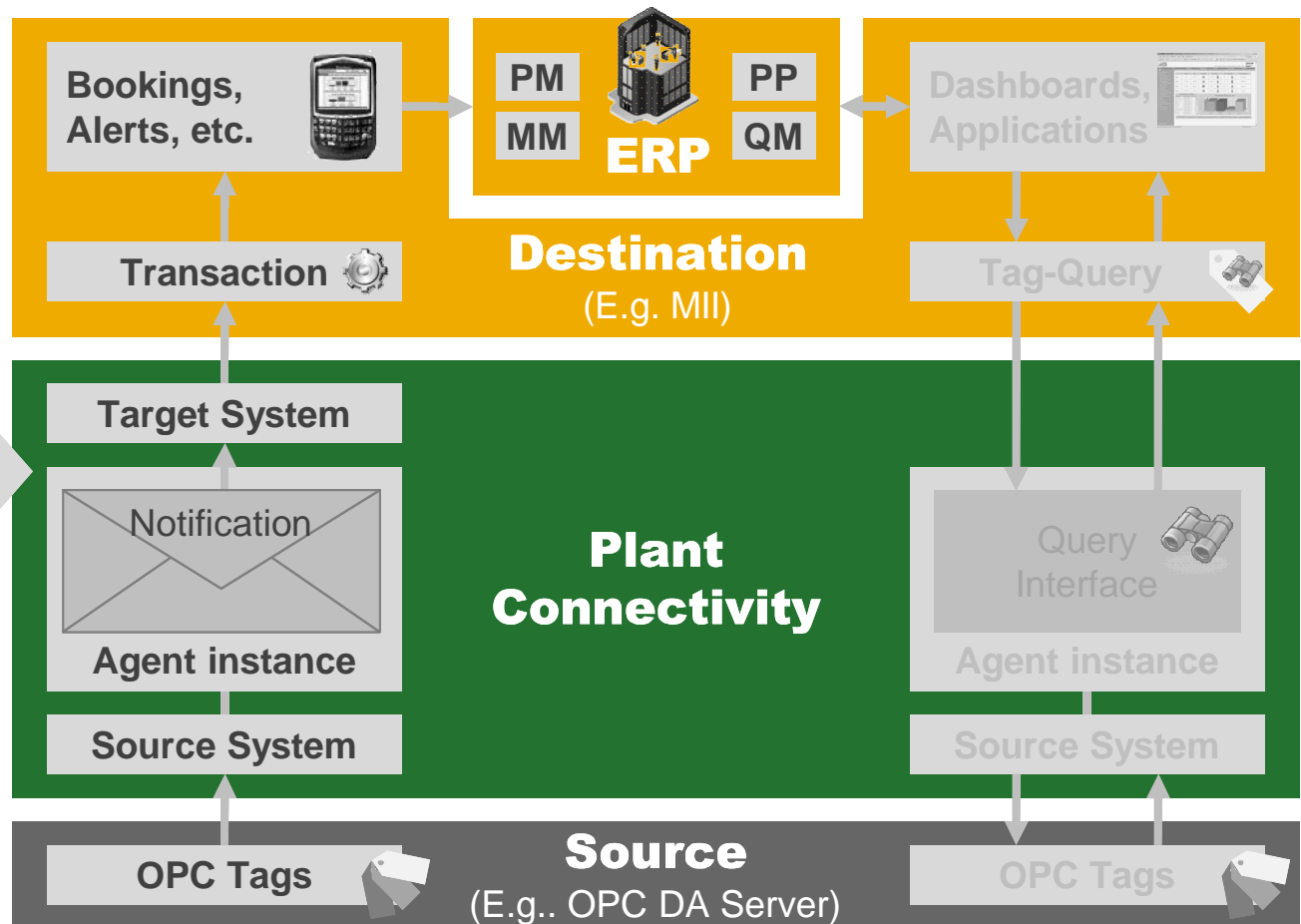


# Plant Connectivity: Processes

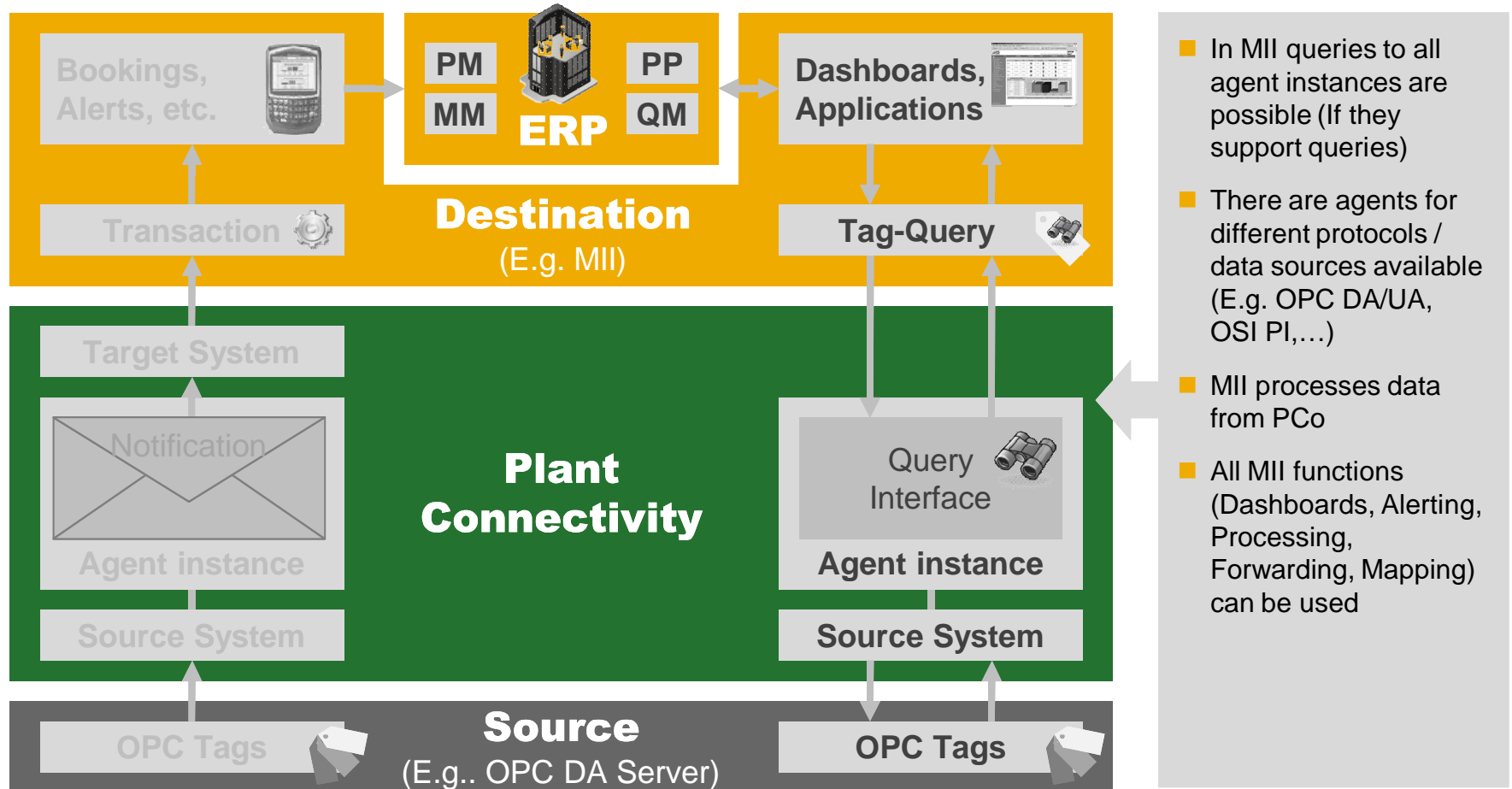


# Plant Connectivity: Notification Process

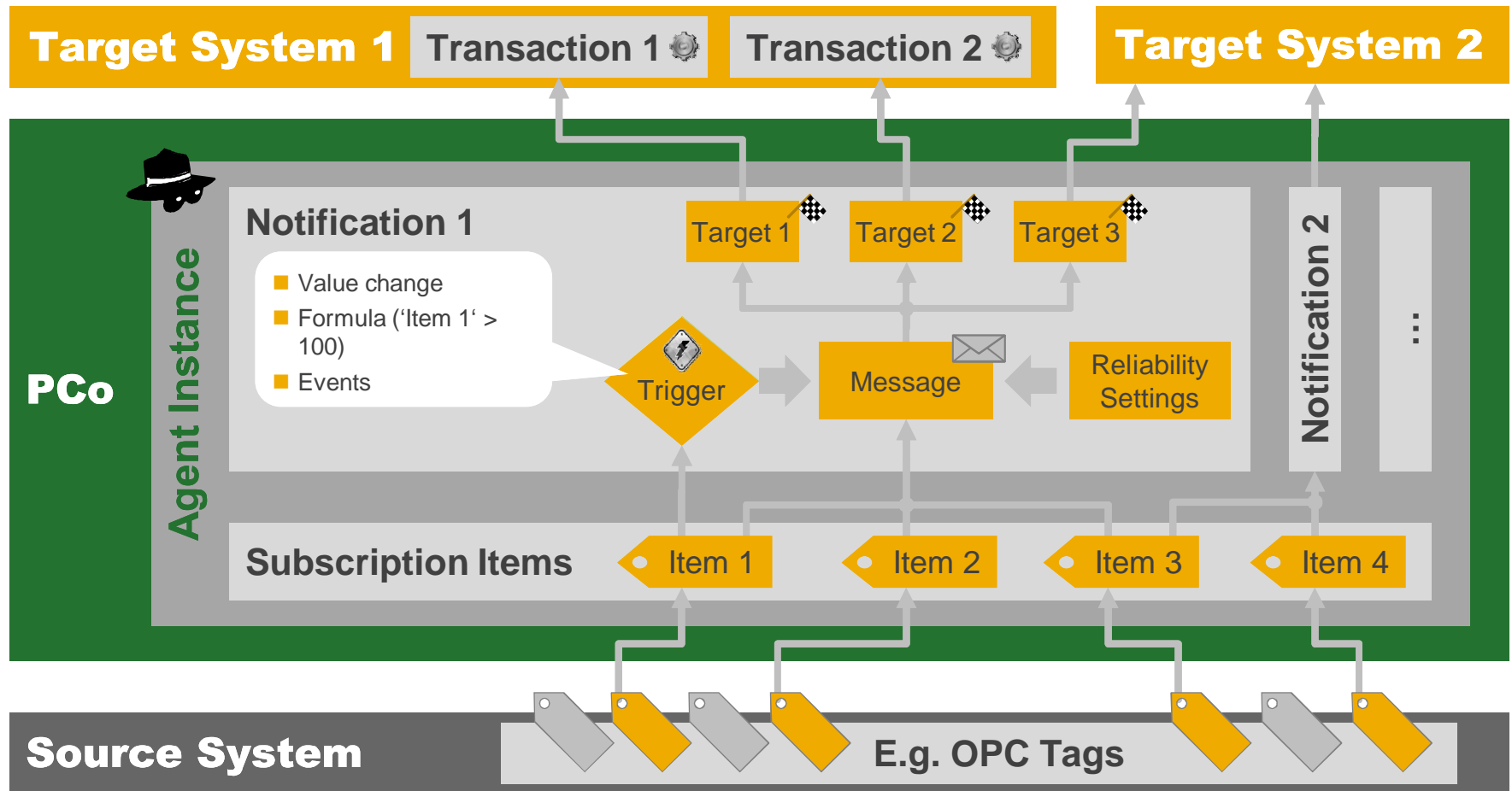
- PCo registers events or condition changes
- PCo creates specific notifications including current data
- Sending to destination(s)
- Target system (e.g. MII) processes the notification
- All MII functions (Dashboards, Alerting, Processing, Forwarding, Mapping) can be used



# Plant Connectivity: Query Process

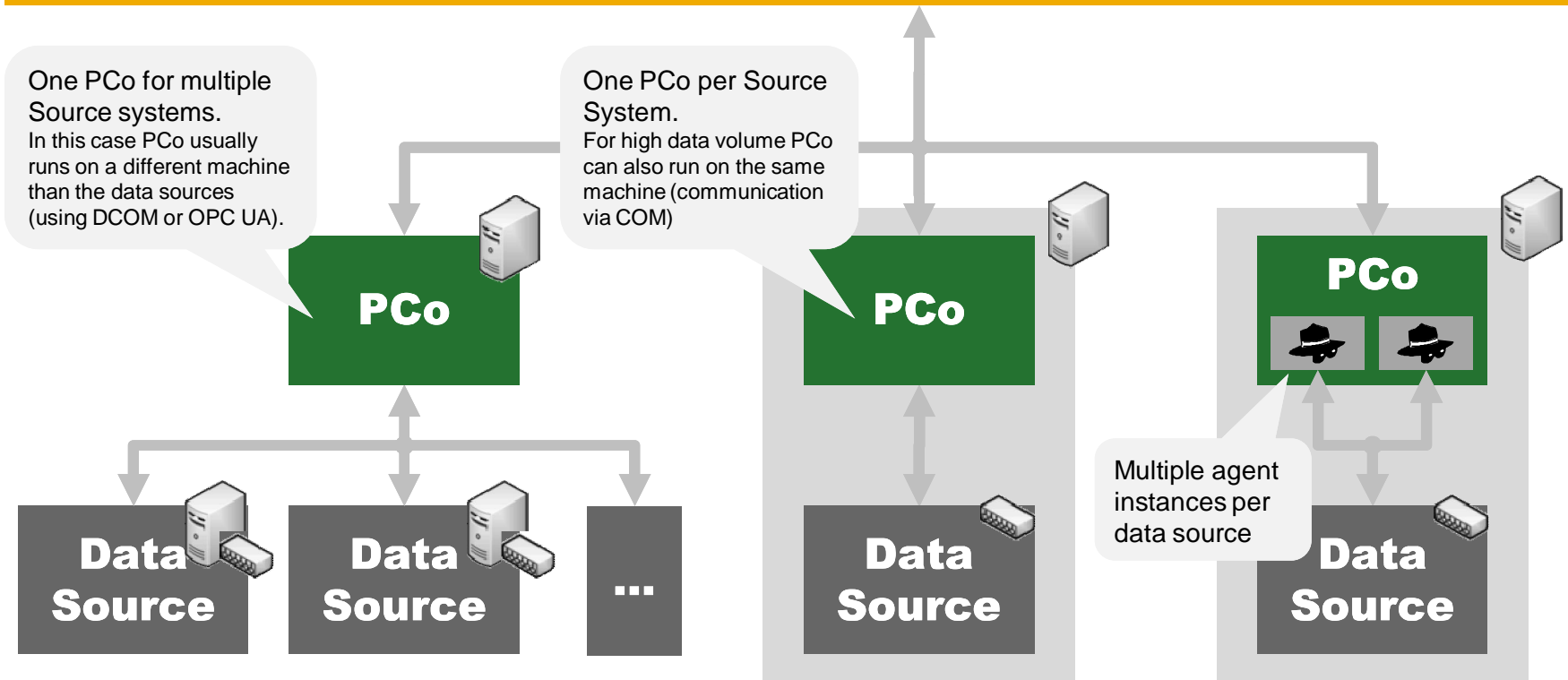


# Details of the PCo Notification Process



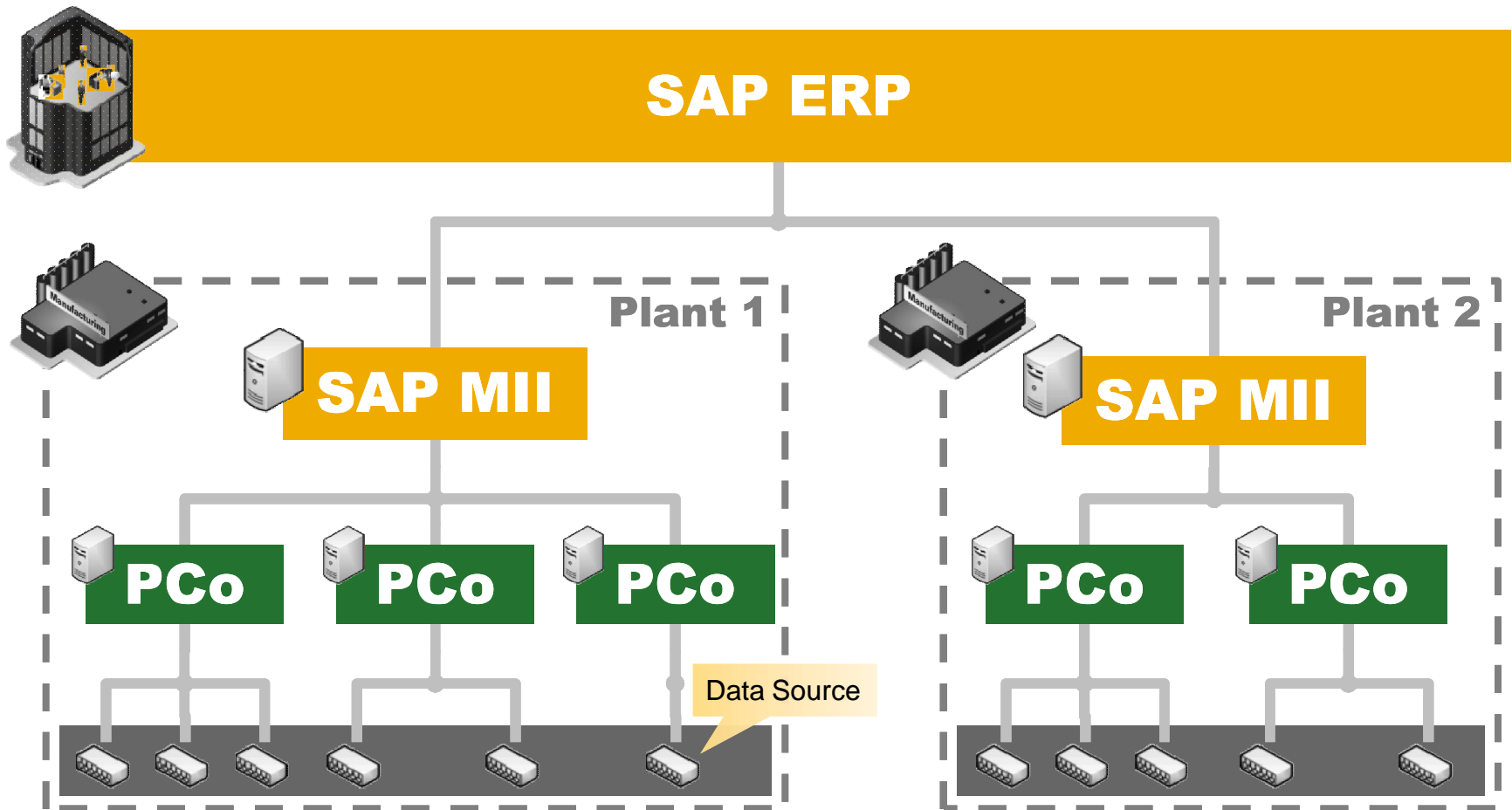
# Plant Connectivity: Architecture Options (Selection)

## Destinations





# Plant Connectivity: Example of System Landscape (PCo/MII/ERP)



# Reliability

## Settings

- Retries
- Persistence
  - ▶ Keep all / first / last
- Lifetime

## Monitoring

- View messages
  - ▶ Retries
  - ▶ Failures
  - ▶ Expired
- View message details
- Resend manually
- Delete manually

### Settings

General | Output | **Reliable Connection** | Destinations

Reliable Message Delivery

Maximum Number of Retries: 3

Retry Interval (Seconds): 60

Failed Message Persistence: KeepLast

Lifetime

Days: 1 Hours: 0 Minutes: 0

### Monitor

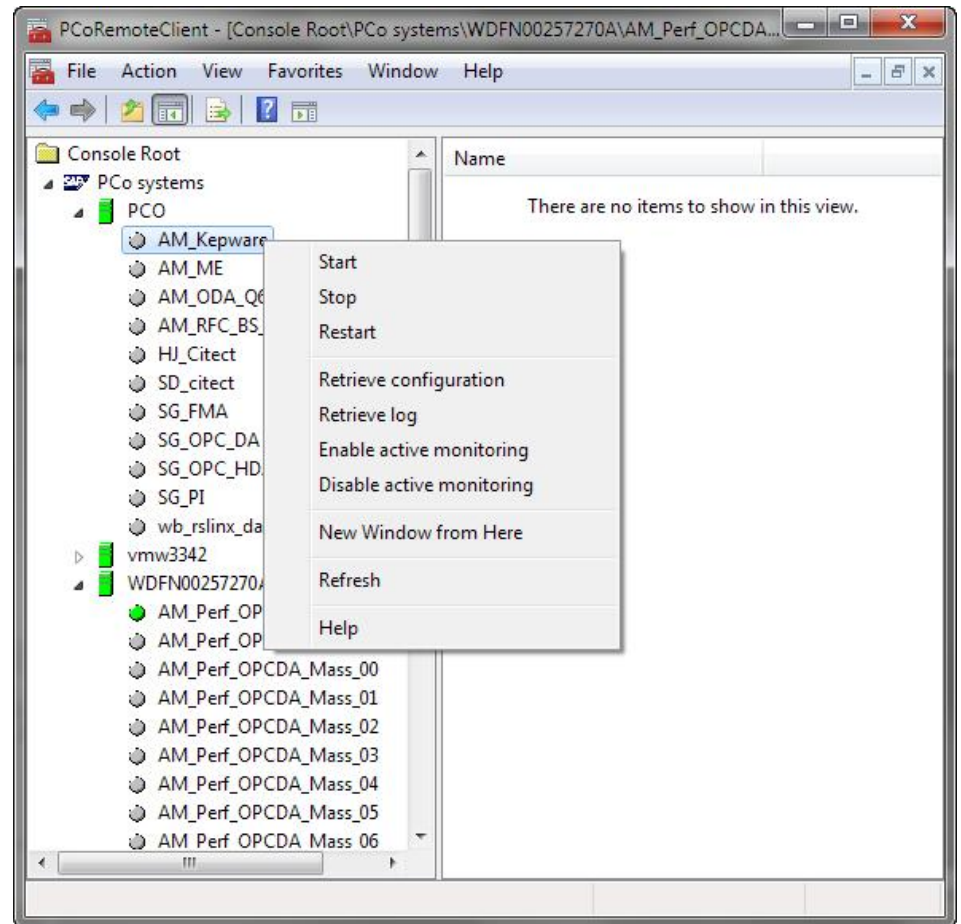
Host	Log	Subscription Items	Query Ports	Tag Query	Message Retries	Message Failures	Expired Messages
Name	Date Created	Date Failed	View	Resend	Delete		
AM_SIM	22.02.2011 09:33	22.02.2011 09:33	View	Resend	Delete		
AM_SIM	22.02.2011 09:33	22.02.2011 09:33	View	Resend	Delete		
AM_SIM	22.02.2011 09:33	22.02.2011 09:33	View	Resend	Delete		

Delete All Resend All Refresh

# Remote Monitoring

## Functions

- Display status (PCo + agent Instances)
- Start/stop/restart of agent instances
- Retrieve configuration (XML)
- Retrieve log (CSV)
- Manage active monitoring



# PCo Functions / Agents

	Function/Agent	PCo 2.0	PCo 2.1
Func.	Bidirectional Queries		new
	Software Development Kit (SDK) for custom agents		new
Source Agent	OPC-DA	x	x
	OPC-A&E	x	x
	OPC-UA	x	x
	Socket Agent (EWM)	x	x
	OPC-HDA		new
	GE Fanuc Proficy Historian		new
	OSISoft PI		new
	OLEDB		new

# PCo Performance (Standard Notebook)

## Queries

Scenario	1/s *	CPU
Query Tester	446	57 %
Internal MII Query	123	18 %
External MII Query (Grinder)	16	2 %

## Notifications

Scenario	1/s *	CPU
Simulation Destination (NUL)	30000	55 %
MI Transaction	60	8 %

\* Maximum results achieved from various test runs

- State of the art hardware is sufficient for high performance (Standard SAP Notebook)
- PCo alone allows high throughput rates (Query Tester / Simulation Destination)
- Together with other target systems (e.g. MII / ME) the performance can be significantly lower.  
Given the low CPU Load on PCo side the bottleneck is likely on the target system side.



# Summary

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- Small .NET-based installation(~ 35 MB):
  - ▶ Near the data source(COM)
  - ▶ In the near-production network (DCOM / OPC-UA Web Service)
- Surveillance of unplanned events:
  - ▶ Events, Value changes, Rule violations (e.g.Limits)
- Rule engine (Expressions)
- Distribution of messages to different destinations: SAP MII, SAP EWM
- Message can contain multiple tag information
- Bi-directional Queries
- Software development kit (SDK) for additional agents
- Fail safe (Buffering and repetition of messages)
- Microsoft MMC-based remote monitoring for surveillance of Agenten instances and multiple PCo Systems



# Thank You!

## Contact information:

Arne Manthey  
Product Manager  
Dietmar-Hopp-Allee 16a, D-69190 Walldorf  
+49 6227 750758

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