



**The Standards Based Integration Company**

*Systems Integration Specialists Company, Inc.*

# **AX-S4 61850**

ACCESS FOR...

Features, Architecture, and  
Applications



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# AX-S4 61850 Description

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- Complete “*Access For IEC 61850*” interface for Windows applications
  - IEC 61850 Client to access data in IEC 61850 devices
  - IEC 61850 Server for gateways, concentrators, and proxies.
  - IEC 61850 GOOSE publisher and subscriber
- Standardized interfaces to applications:
  - OLE for Process Control (<http://www.opcfoundation.org>) Data Access (DA) V3.0
  - Dynamic Data Exchange (DDE)
- Also supports UCA 2.0 (IEEE TR1550) and generic MMS (ISO 9506)
- Formerly Called AX-S4 MMS.



# AX-S4 61850 Basic Application

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Windows Based  
HMI – SCADA System

OPC Client Interface

OPC Server Interface

**AX-S4 61850**  
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IEC 61850 Client

Ethernet Adapter

Substation Ethernet LAN



IEC 61850  
Devices  
(servers)





# **AX-S4 61850** Client Features

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- IEC 61850 Client functions supported (OPC Server):
  - ❑ Object discovery and automatic configuration of data using ACSI services
  - ❑ SCL (IEC 61850-6-1) import to configure client with remote device data objects
  - ❑ Transparent and Automatic Handling of Buffered and Unbuffered Reporting
  - ❑ Read/Write of any IEC 61850 Object
  - ❑ Automated Controls (Direct and SBO with Normal or Enhanced Security)
  - ❑ Logs
  - ❑ File Transfer client and server
- Includes interactive object explorer for device object visualization, debug, testing, configuration, and control.



# AX-54 61850 Server Features

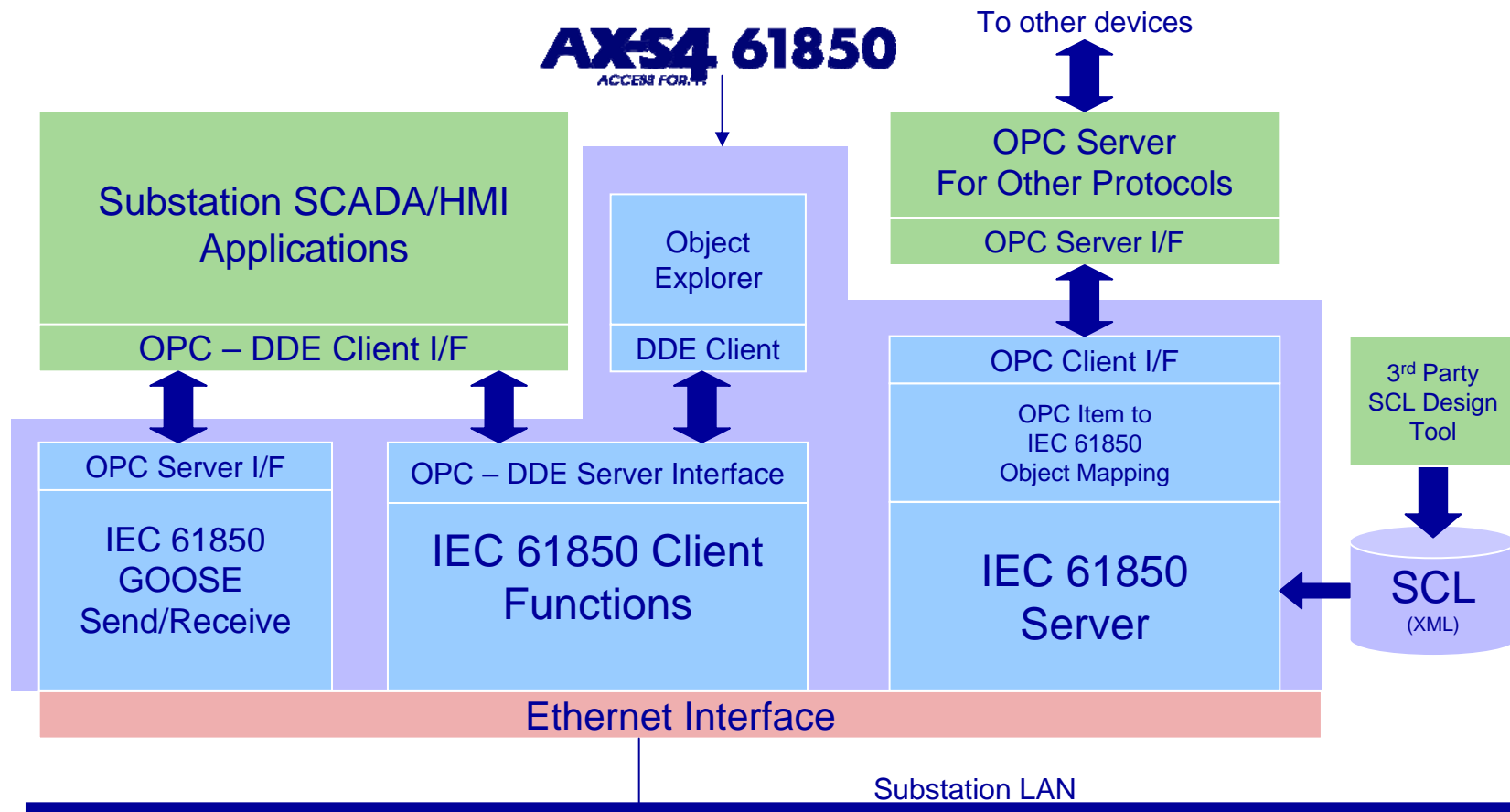
ACCESS FOR...

- IEC 61850 Server functions supported via OPC Client DA interface:
  - ❑ Configuration of IEC 61850 server via SCL (IEC 61850-6-1)
  - ❑ Mapping of IEC 61850 objects to external OPC server for dynamic data.
  - ❑ Fixed value initialization via SCL or mapping file for static data.
  - ❑ Read/Write of any IEC 61850 Object
  - ❑ Buffered and Unbuffered Reporting
  - ❑ Controls (Direct and SBO via Normal Security)
  - ❑ Full support for object discovery and automatic configuration of data by clients using ACSI services



# AX-54 61850 Architecture

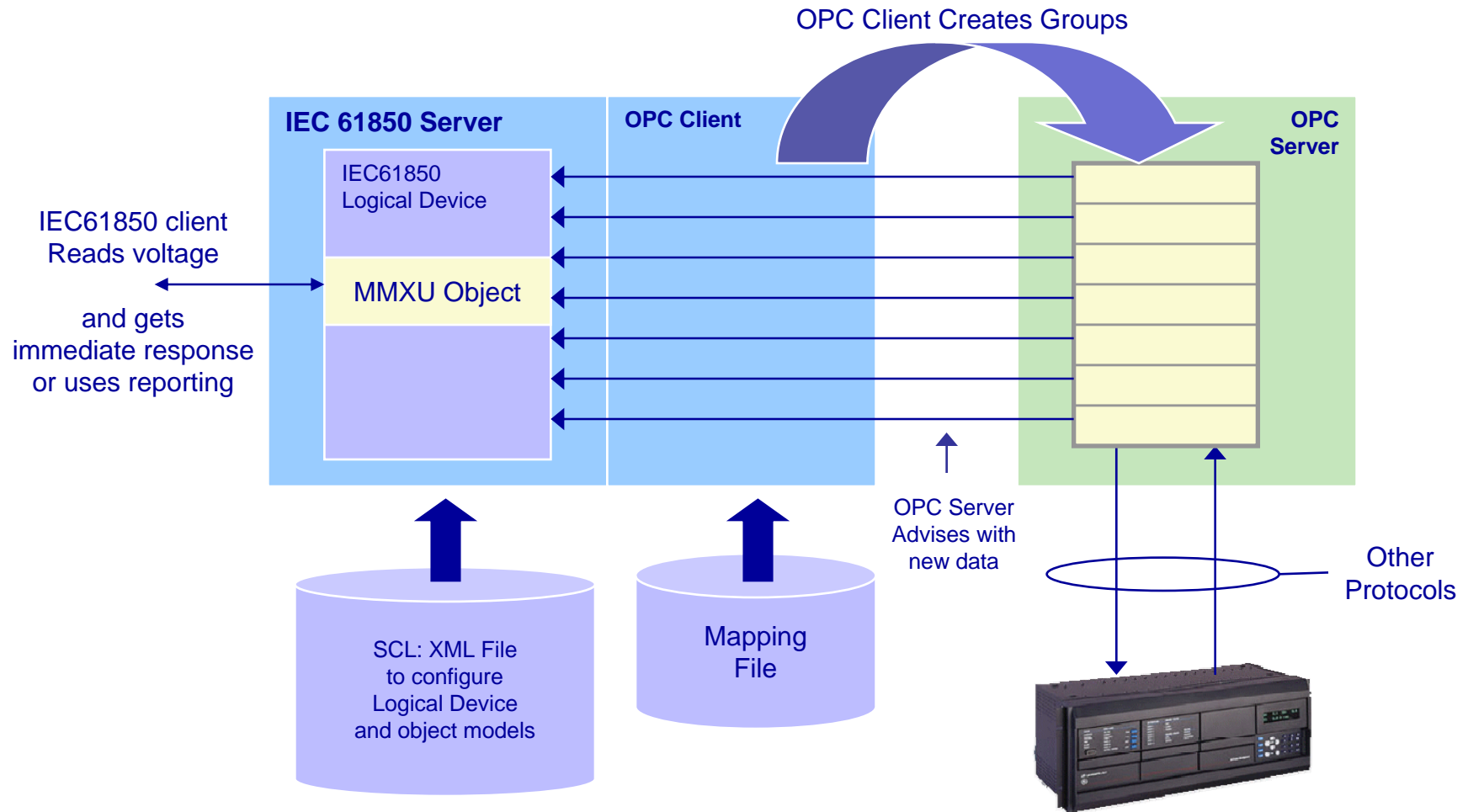
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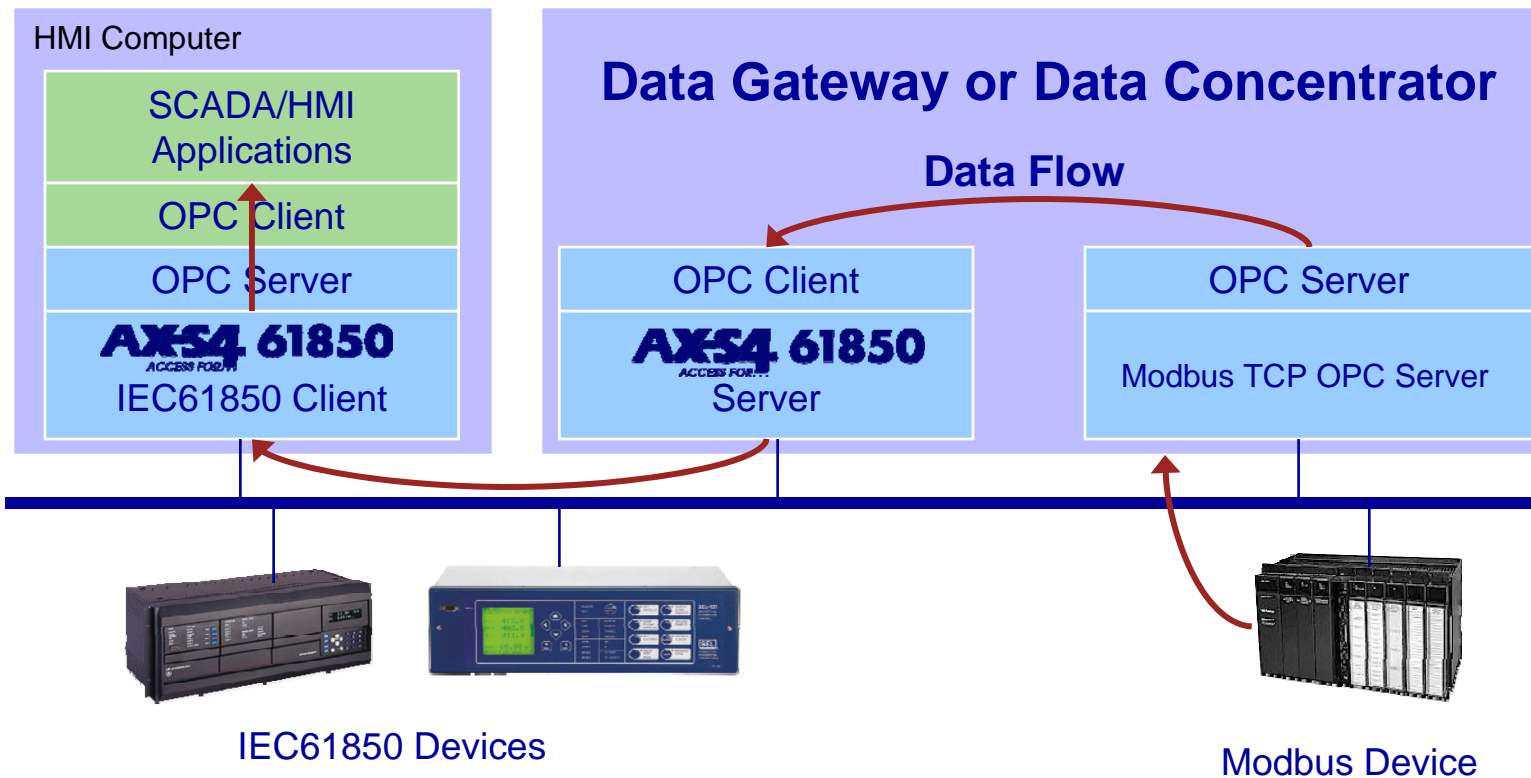
# AX-54 61850 Server

ACCESS FOR...





# AXS4 61850 Server Application



Modbus shown as an example.  
Any protocols for which an OPC server exists can be used.



# Example Mapping File: IEC 61850 gateway to Modbus Device

Logical Device	IEC 61850 Item	OPC Server from which to read/write data	OPC Item	OPC Group defined in IOCLASS.CFG	Initial Value
CTRL	AlmGGIO1\$ST\$Beh\$stVal	KEPware.KEPServerEx.V4	Simulated.User.beh_stVal	ReadOnlyDyn	
CTRL	AlmGGIO1\$ST\$Health\$stVal	KEPware.KEPServerEx.V4	Simulated.User.Health_stVal	ReadOnlyDyn	
CTRL	AlmGGIO1\$ST\$SPSCO1\$stVal	SISCO.AXS4GOOSE.1	Local.SISCO_IED1CTRL/SPSCO1\$stVal	ReadWriteDyn	Mapped to AX-S4 61850 GOOSE publisher
CTRL	AlmGGIO1\$CF\$Mod\$ctlModel	KEPware.KEPServerEx.V4	Simulated.User.ctlModel	ReadOnlyStatic	
CTRL	AlmGGIO1\$CF\$SPSCO1\$ctlModel	KEPware.KEPServerEx.V4	Simulated.User.ctlModel	ReadOnlyStatic	
CTRL	AlmGGIO1\$DC\$NamPlt\$vendor	KEPware.KEPServerEx.V4	Simulated.User.vendorSISCO	ReadOnlyStatic	
CTRL	AlmGGIO1\$DC\$NamPlt\$swRev	KEPware.KEPServerEx.V4	Simulated.User.swRev	ReadOnlyStatic	
CTRL	AlmGGIO1\$DC\$NamPlt\$d	KEPware.KEPServerEx.V4	Simulated.User.namPltSISCO	ReadOnlyStatic	
CTRL	AlmGGIO1\$DC\$NamPlt\$configRev	KEPware.KEPServerEx.V4	Simulated.User.configRev	ReadOnlyStatic	
CTRL	AlmGGIO1\$EX\$NamPlt\$InNs	dummy_opcserver	dummy_opcitem	ReadOnlyStatic	IEC 61850-7-4:2003
CTRL	MMXU1\$MX\$Hz\$mag\$f	KEPware.KEPServerEx.V4	MODBUS.GEUR.HzMagf	ReadOnlyDyn	
CTRL	MMXU1\$MX\$PhV\$phsA\$cVal\$mag\$f	KEPware.KEPServerEx.V4	MODBUS.GEUR.PhsA_V_Mag	ReadOnlyDyn	
CTRL	MMXU1\$MX\$PhV\$phsA\$cVal\$ang\$f	KEPware.KEPServerEx.V4	MODBUS.GEUR.PhsA_V_Ang	ReadOnlyDyn	
CTRL	MMXU1\$MX\$PhV\$phsB\$cVal\$mag\$f	KEPware.KEPServerEx.V4	MODBUS.GEUR.PhsB_V_Mag	ReadOnlyDyn	
CTRL	MMXU1\$MX\$PhV\$phsB\$cVal\$ang\$f	KEPware.KEPServerEx.V4	MODBUS.GEUR.PhsB_V_Ang	ReadOnlyDyn	
CTRL	MMXU1\$MX\$PhV\$phsC\$cVal\$mag\$f	KEPware.KEPServerEx.V4	MODBUS.GEUR.PhsC_V_Mag	ReadOnlyDyn	
CTRL	MMXU1\$MX\$PhV\$phsC\$cVal\$ang\$f	KEPware.KEPServerEx.V4	MODBUS.GEUR.PhsC_V_Ang	ReadOnlyDyn	
CTRL	MMXU1\$MX\$A\$phsA\$cVal\$mag\$f	KEPware.KEPServerEx.V4	MODBUS.GEUR.PhsA_A_Mag	ReadOnlyDyn	
CTRL	MMXU1\$MX\$A\$phsA\$cVal\$ang\$f	KEPware.KEPServerEx.V4	MODBUS.GEUR.PhsA_A_Ang	ReadOnlyDyn	
CTRL	MMXU1\$MX\$A\$phsB\$cVal\$mag\$f	KEPware.KEPServerEx.V4	MODBUS.GEUR.PhsB_A_Mag	ReadOnlyDyn	
CTRL	MMXU1\$MX\$A\$phsB\$cVal\$ang\$f	KEPware.KEPServerEx.V4	MODBUS.GEUR.PhsB_A_Ang	ReadOnlyDyn	
CTRL	MMXU1\$MX\$A\$phsC\$cVal\$mag\$f	KEPware.KEPServerEx.V4	MODBUS.GEUR.PhsC_A_Mag	ReadOnlyDyn	
CTRL	MMXU1\$MX\$A\$phsC\$cVal\$ang\$f	KEPware.KEPServerEx.V4	MODBUS.GEUR.PhsC_A_Ang	ReadOnlyDyn	

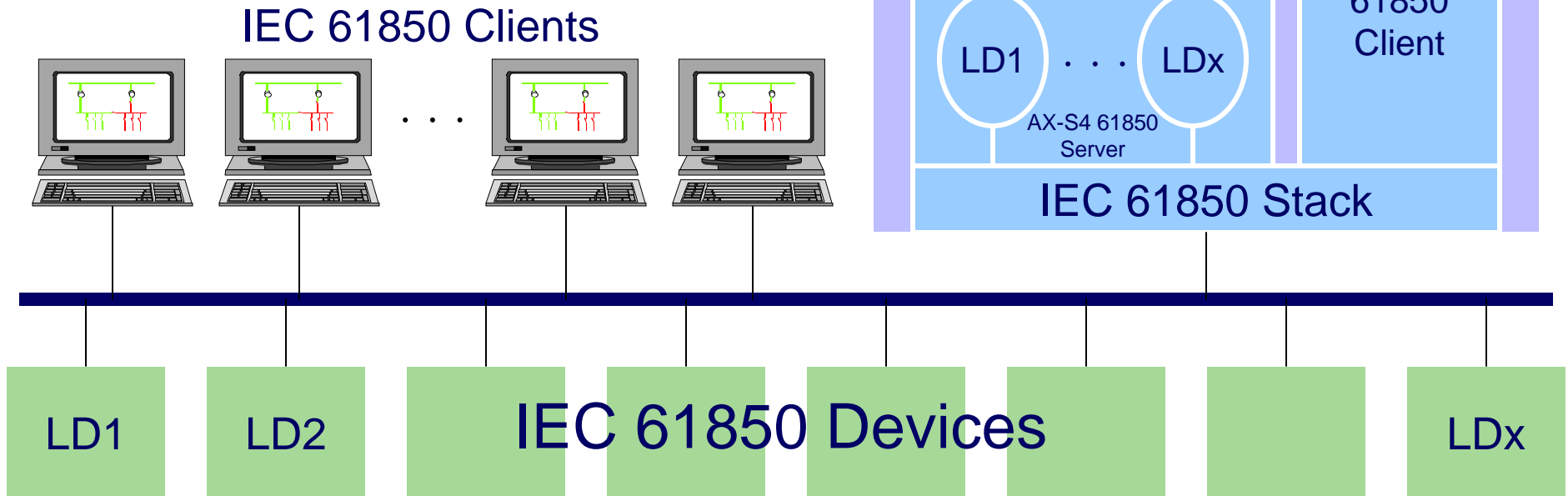
Unmapped item with initial value

Mapped to Modbus OPC Server for device data (for example)



# AX-S4 61850 as an IEC 61850 Proxy

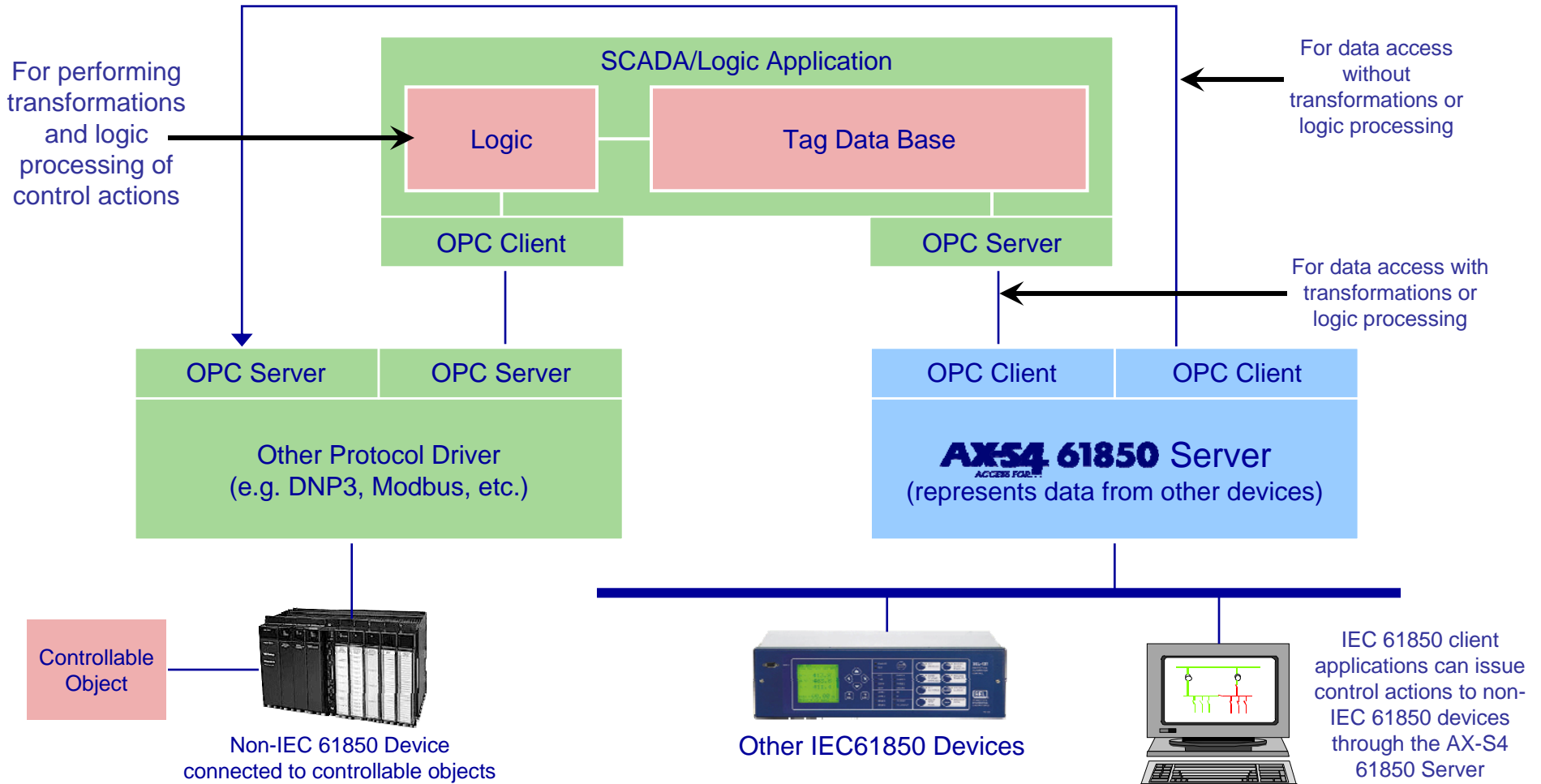
IEC 61850 clients access the proxy server instead of devices directly. Enables multiple clients to share a single application association to the device.





# AX-S4 61850 Gateway Application

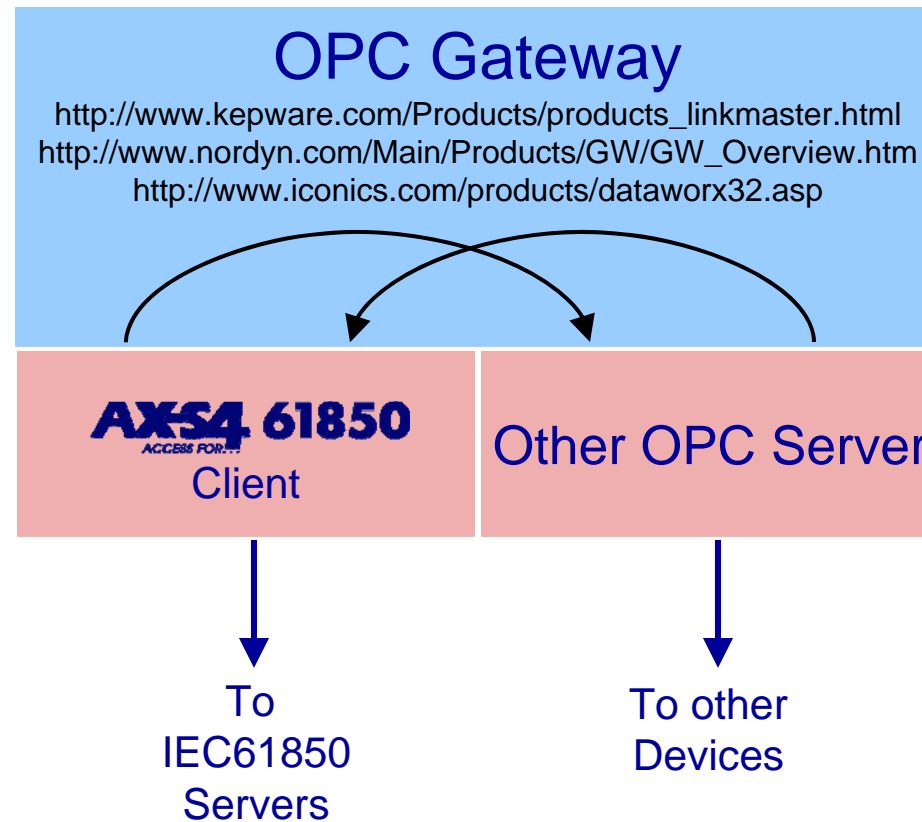
## Gateway with Transformations and Complex Control Processing





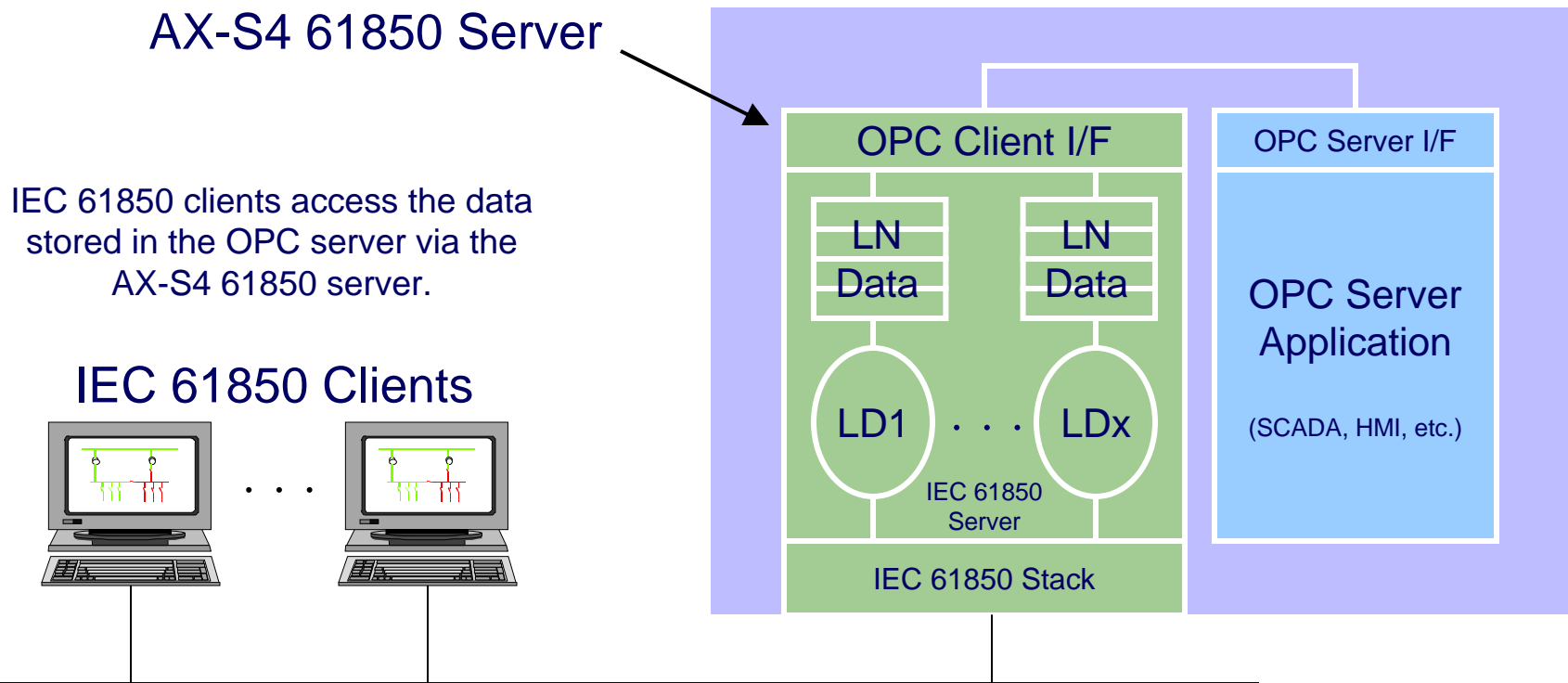
# **AX-54 61850** Data Bridge Application

Using OPC Bridge/Gateway and IEC 61850 Client



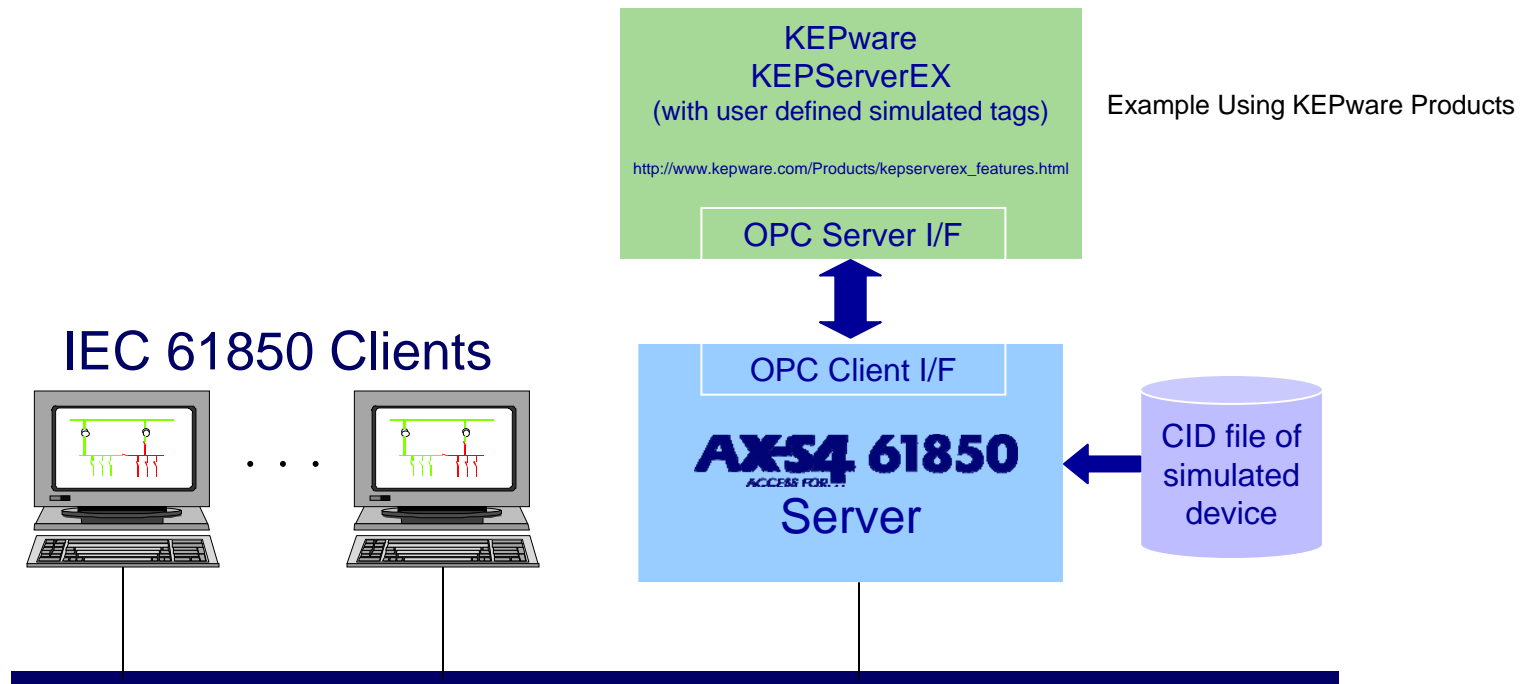


# AX-S4 61850 to Expose OPC server data to IEC 61850 clients





# AX-54 61850 as an IEC 61850 Device Simulator





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Please contact SISCO for Evaluation  
Licenses or Any Other Questions on

**AX-54 61850**  
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Thank You



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