



Interoperability Issues in Energy Automation

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TRANSMISSION AUTOMATION & PROTECTION CONTROL FLISR STEUERN NETZLEITTECHNIK ÜBERWACHEN

CONTROL MONITORING ÜBERTRAGUNG

DIGITAL AUTOMATION SCADA SCHÜTZEN

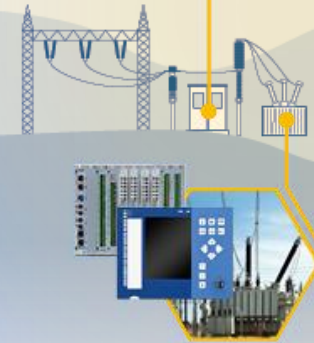
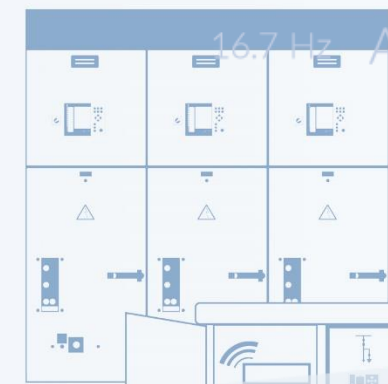
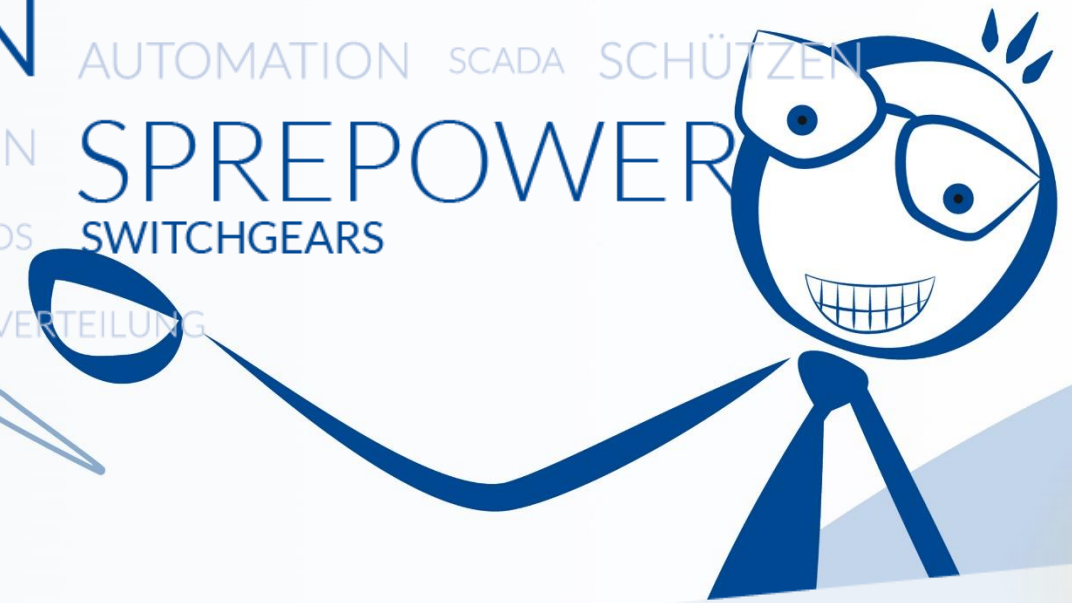
IT SECURITY DISTRIBUTION VISUALISATION

NETZLEITTECHNIK VISUALISIERUNG SMART GRIDS SWITCHGEARS

PROTECTION SELF-HEALING GRIDS DIGITAL VERTEILUNG

16.7 Hz AUTOMATISIEREN

sprecher
automation



GENERATION ERZEUGEN TRANSMISSION ÜBERTRAGEN DISTRIBUTION VERTEILEN INFRASTRUCTURE INFRASTRUKTUR SMART GRID

Business Areas

- Power system automation, protection, & control
- Switchgears & substations
- Industrial automation

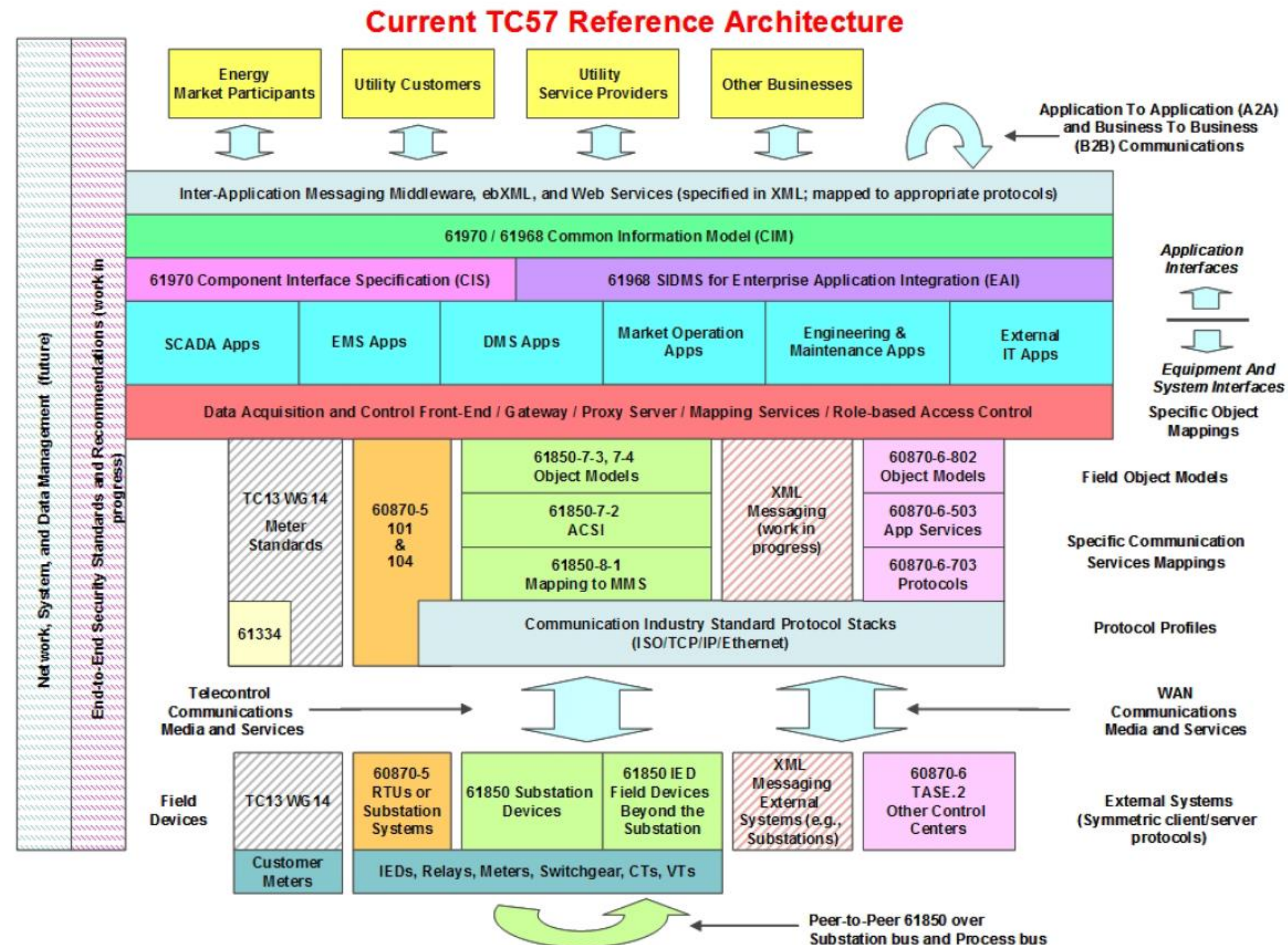
Company History

- 2002 MBO Alstom, 160 Employees, 1 Site
- 2019: ~550 Mitarbeiter, 11 Sites
40 nations, 530 customers, > 2500 projects



Interoperable Communication?

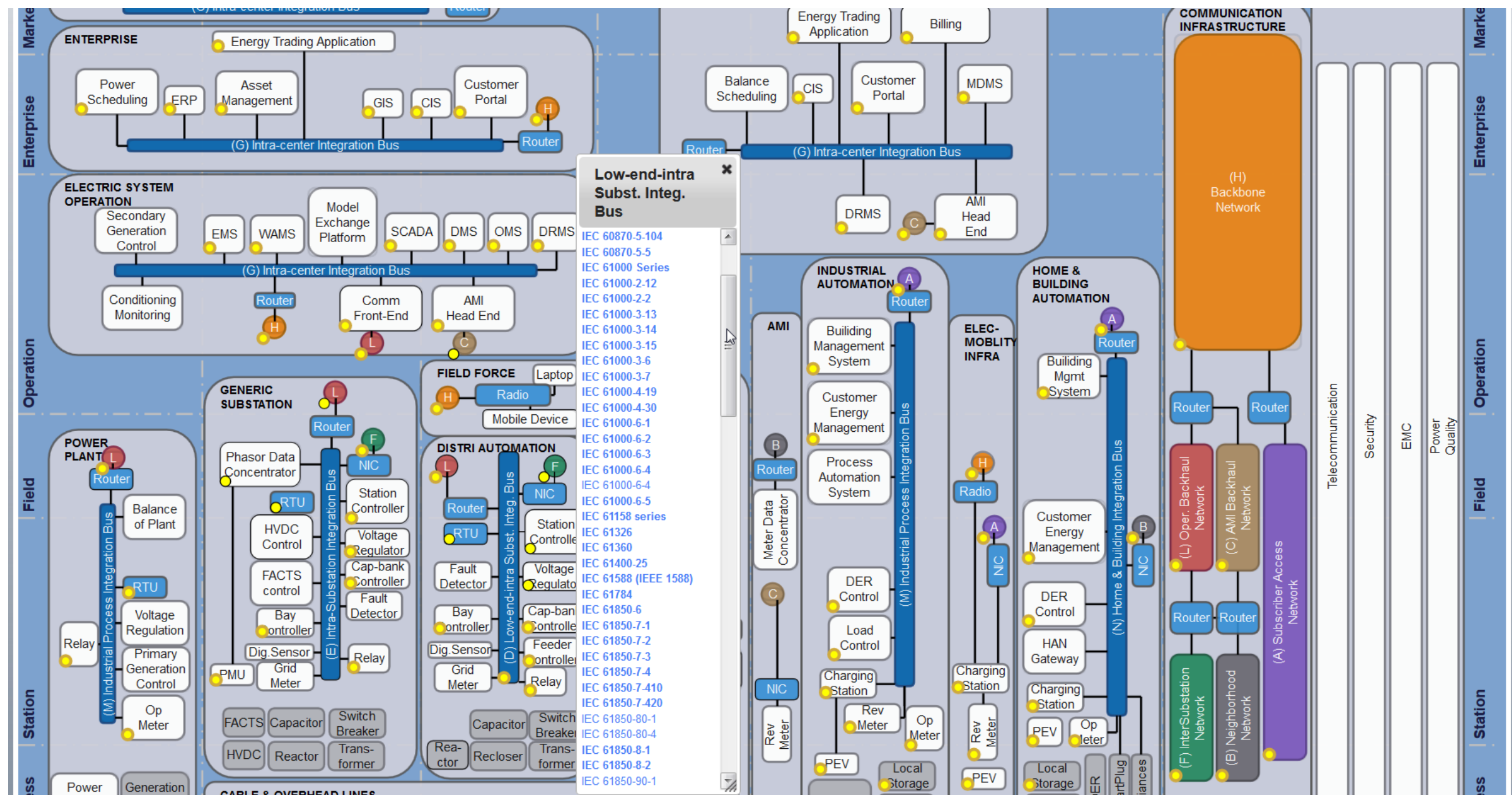
CIM Reference Model – IEC 61970



*Notes: 1) Solid colors correlate different parts of protocols within the architecture.

2) Non-solid patterns represent areas that are future work, or work in progress, or related work provided by another IEC TC.

<http://smartgridstandardsmap.com/>



Verteiltes Automatisierungsnetzwerk



Vendor A

Communication protocol:
common language



Vendor B



Systemkurzbezeichnung	S14
Bezeichnung:	Leitwarte
Typ:	zu Zentrale
Protokoll:	ABB-RP570 (Slave)
Linie (Datenbank):	ABB (Standard) ABB-RP570 (Master) ABB-RP570 (Slave) ABB-RTU200 AEG SEAB1-F GEADAT92 DNP V3.00 ESCFW-EE PCM232 IDS (Standard) IEC 60870-5-101 (Master)
PBK [konfig.ini]:	
	IEC 60870-5-104 Zentrale (Master) Landis&Gyr MODBUS ROSEMOUNT SAT (OKA) SAT (Siemens) SAT (Standard) Siemens FW537 SINAUT 8-FW

Interoperability in Practice



<https://curtisguilbot.wordpress.com/2015/06/11/how-to-overcome-incomplete-enterprise-software-requirements/>

- „Common language“ (i.e. communication protocol) is only one building block
- What about the content?
 - Which measurements to send
 - In which format
 - Which time zone
 - How often
 - ...
- Standard-conformity equals interoperability?
- What about cybersecurity?
 - Encryption algorithms
 - Hashing algorithms
 - Key exchange mechanisms
 - ...

Conclusion

- For some common use cases, communication protocols for process data are well standardized and established
- Increasing digitalization leads to increasing amount of use cases for data exchange
- → Increasing need for common profiles
- Common, established and independent process for profile development, publication and testing is necessary!

